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APPLICATION NOTICE

< BASIC INSPECTION > [TYPE 1]

BASIC INSPECTION

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 1]

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-12. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

< BASIC INSPECTION > [TYPE 1]

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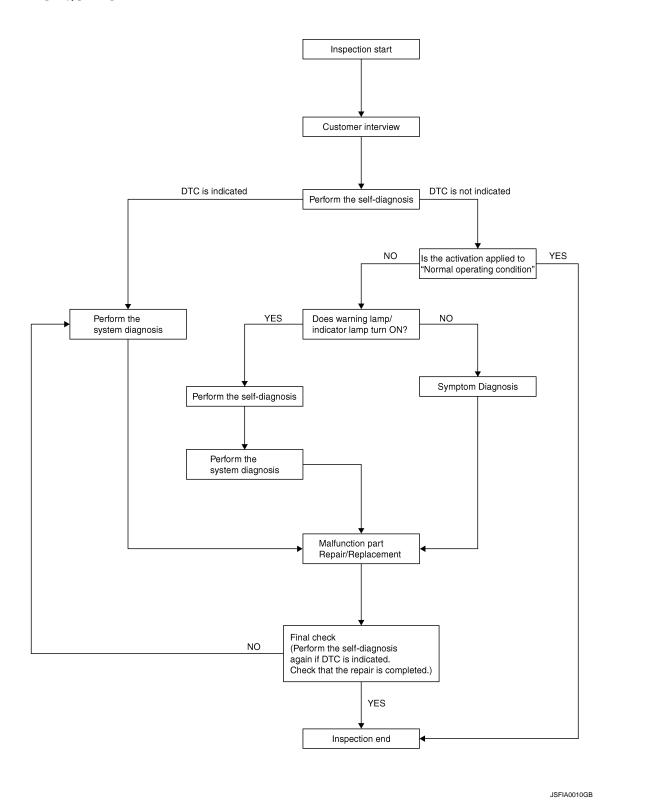
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OVERALL SEQUENCE



DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-11, "Diagnostic Work Sheet".

< BASIC INSPECTION > [TYPE 1]

2.perform the self-diagnosis

Check the DTC display with the self-diagnosis function. Refer to BRC-26, "CONSULT-III Function (ABS)".

Is there any DTC displayed?

YES >> GO TO 3 NO >> GO TO 4

3.PERFORM THE SYSTEM DIAGNOSIS

Perform the diagnosis applicable to the displayed DTC. Refer to BRC-113, "DTC No. Index".

>> GO TO 7

4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION

Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-123</u>, <u>"Description"</u>.

Is the symptom a normal operation?

YES >> Inspection End NO >> GO TO 5

${f 5.}$ CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION

Check that the warning lamp and indicator lamp illuminate.

- ABS warning lamp: Refer to BRC-87, "Description".
- Brake warning lamp: Refer to BRC-88, "Description".
- VDC OFF indicator lamp: Refer to <u>BRC-89</u>, "<u>Description</u>".
- SLIP indicator lamp: Refer to BRC-90, "Description".

Is ON/OFF timing normal?

YES >> GO TO 6 NO >> GO TO 2

$\mathbf{6}.\mathsf{PERFORM}$ THE DIAGNOSIS BY SYMPTOM

Perform the diagnosis applicable to the symptom.

>> GO TO 7

7.REPAIR OR REPLACE THE MALFUNCTIONING PARTS

Repair or replace the specified malfunctioning parts.

>> GO TO 8

8. FINAL CHECK

Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase the self-diagnosis memory. Refer to <u>BRC-26</u>, "CONSULT-III Function (ABS)".

Is no other DTC present and the repair completed?

YES >> Inspection End

NO >> GO TO 3

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 1]

Diagnostic Work Sheet

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Customer name MR/MS	Model & Year		VIN		
Engine #	Trans.		Mileage	Mileage	
Incident Date	Manuf. Date		In Service Dat	е	
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	(from engine compartment) activate ☐ Noise and vibration		Firm pedal operation Large stroke pedal operation	
	☐ TCS does not work (Rear wheels slip when accelerating) ☐ ABS does not work (Wheels lock when braking)			☐ Lack of sense of acceleration	
Engine conditions	☐ When starting ☐ After starting				
Road conditions	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes				
Driving conditions	☐ Full-acceleration ☐ High speed cornering ☐ Vehicle speed: Greater than 10 km/h (6 MPH) ☐ Vehicle speed: 10 km/h (6 MPH) or less ☐ Vehicle is stopped				
Applying brake conditions	□ Suddenly □ Gradually				
Other conditions	☐ Operation of electrical equipment ☐ Shift change ☐ Other descriptions				

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BRC-11

INSPECTION AND ADJUSTMENT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description

INFOID:0000000003937712

After replacing the ABS actuator and electric unit (control unit), perform the following procedures:

- Neutral position adjustment for the steering angle sensor
- · Calibration of the decel G sensor

ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement

${f 1}$.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR

Perform the neutral position adjustment for the steering angle sensor.

>> Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Special Repair Requirement", GO TO 2

2.PERFORM CALIBRATION OF THE DECEL G SENSOR

Perform calibration of the decel G sensor.

>> Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement". ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description

INFOID:0000000003937714

Refer to the table below to determine if adjustment of steering angle sensor neutral position is required.

×: Required -: Not required

Situation	Adjustment of steering angle sensor neutral position
Removing/Installing ABS actuator and electric unit (control unit)	_
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	_
Tire rotation	_
Adjusting wheel alignment	×
Battery disconnection	×

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement

ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

To adjust neutral position of steering angle sensor, make sure to use CONSULT-III (Adjustment cannot be done without CONSULT-III)

ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

< BASIC INSPECTION > Α >> GO TO 2 2.perform the neutral position adjustment for the steering angle sensor On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order. Touch "START". **CAUTION:** Do not touch steering wheel while adjusting steering angle sensor. 3. After approximately 10 seconds, touch "END". After approximately 60 seconds, it ends automatically. 4. Turn ignition switch OFF, then turn it ON again. **CAUTION:** Be sure to perform above operation. Е >> GO TO 3 3. CHECK DATA MONITOR **BRC** Run vehicle with front wheels in straight-ahead position, then stop. Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°. Is the steering angle within the specified range? YES >> GO TO 4 NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1 $oldsymbol{4}.$ ERASE THE SELF-DIAGNOSIS MEMORY Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM. ABS actuator and electric unit (control unit): Refer to BRC-26, "CONSULT-III Function (ABS)" • ECM: Refer to EC-73, "CONSULT-III Function (ENGINE)" (VQ40DE) or EC-546, "CONSULT-III Function (ENGINE)" (VK56DE). Are the memories erased? YES >> Inspection End >> Check the items indicated by the self-diagnosis. CALIBRATION OF DECEL G SENSOR CALIBRATION OF DECEL G SENSOR: Description INFOID:0000000003937716 Refer to the table below to determine if calibration of the decel G sensor is required. x: Required -: Not required Situation Calibration of decel G sensor Removing/Installing ABS actuator and electric unit (control unit) Replacing ABS actuator and electric unit (control unit) Removing/Installing steering angle sensor Replacing steering angle sensor X Ν Removing/Installing steering components × Replacing steering components ×

CALIBRATION OF DECEL G SENSOR: Special Repair Requirement

INFOID:0000000003937717

CALIBRATION OF DECEL G SENSOR **CAUTION:**

Removing/Installing suspension components

Replacing suspension components

Change tires to new ones

Adjusting wheel alignment

Tire rotation

< BASIC INSPECTION > [TYPE 1]

To calibrate the decel G sensor, make sure to use CONSULT-III (Calibration cannot be done without CONSULT-III)

1. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

>> GO TO 2

2. PERFORM CALIBRATION OF DECEL G SENSOR

- 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATION" in order.
- 2. Touch "START".
- 3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3

3.CHECK DATA MONITOR

- 1. Run vehicle with front wheels in straight-ahead position, then stop.
- 2. Select "DATA MONITOR". Then make sure "DECEL G SEN" is within \pm .

Is the inspection result normal?

YES >> GO TO 4

NO >> Perform calibration of decel G sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to BRC-26, "CONSULT-III Function (ABS)".
- ECM: Refer to <u>EC-73</u>, "<u>CONSULT-III Function (ENGINE)</u>" (VQ40DE) or <u>EC-546</u>, "<u>CONSULT-III Function (ENGINE)</u>" (VK56DE).

Are the memories erased?

YES >> Inspection End

NO >> Check the items indicated by the self-diagnosis.

APPLICATION NOTICE

< FUNCTION DIAGNOSIS > [TYPE 1]

FUNCTION DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

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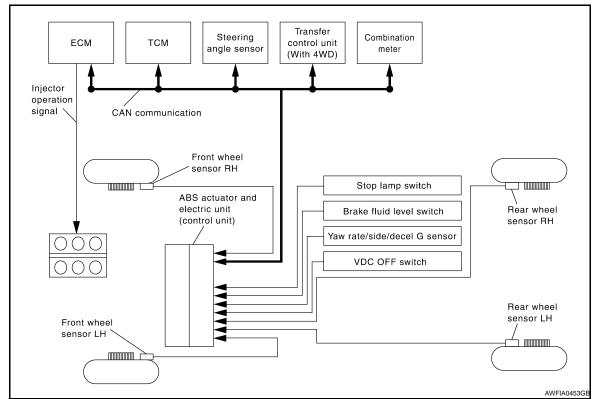
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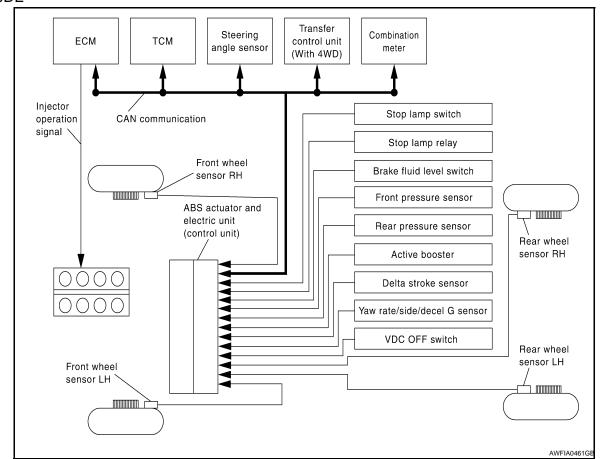
System Diagram

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VQ40DE



VK56DE



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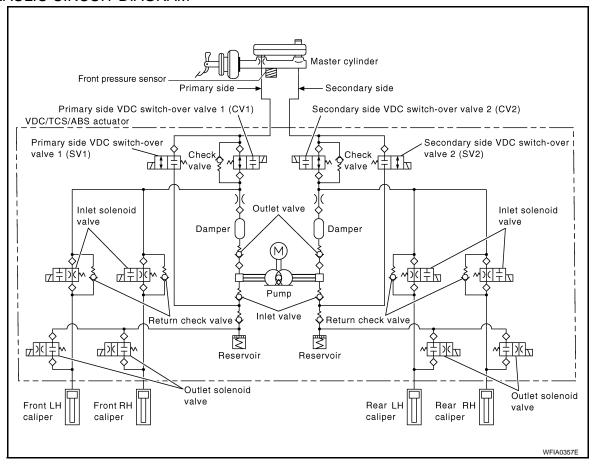
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HYDRAULIC CIRCUIT DIAGRAM



System Description

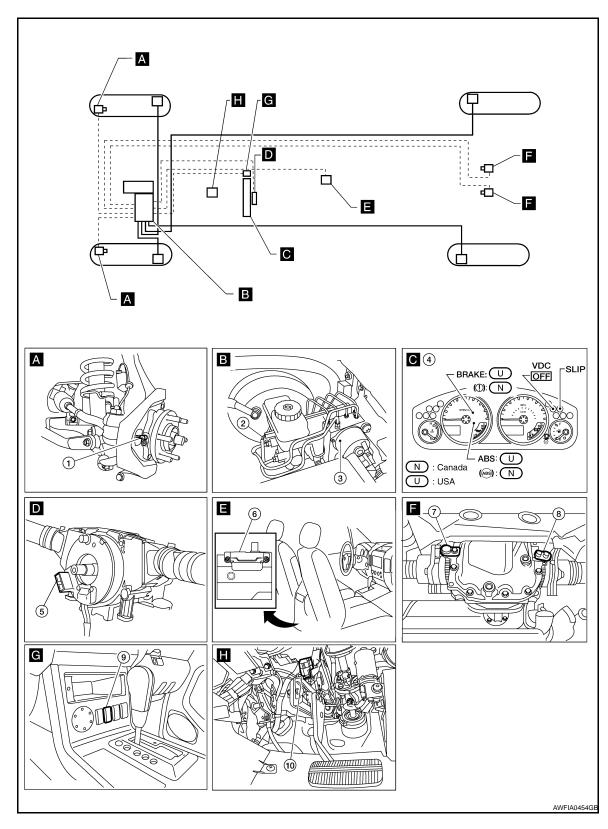
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- Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensors. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.
- During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.
- Active booster, delta stroke sensor, front pressure sensor, rear pressure sensor and stop lamp relay are available on vehicles equipped with VK56DE only.

Component Parts Location

INFOID:0000000003937721

VQ40DE



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Combination meter M24
- 7. Rear wheel sensor LH C13
- 10. Stop lamp switch E38

- Brake fluid level switch E21
- Steering angle sensor (behind spiral cable) M47
- 8. Rear wheel sensor RH C13
- 3. ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73
- 9. VDC OFF switch M154

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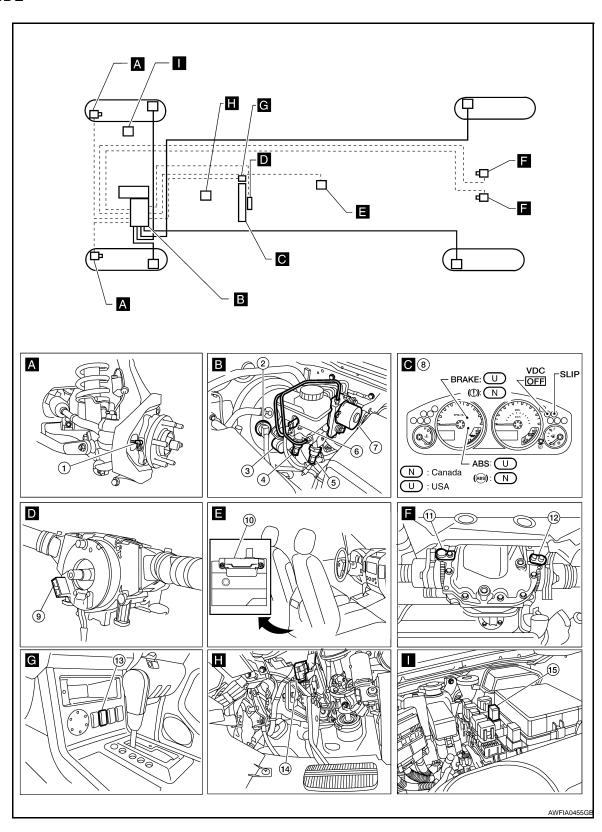
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VK56DE



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Rear pressure sensor E32
- 7. ABS actuator and electric unit (control 8. unit) E127
- 2. Delta stroke sensor E114
- 5. Front pressure sensor E31
 - Combination meter M24
- 3. Active booster E49
- 6. Brake fluid level switch E21
- 9. Steering angle sensor (behind spiral cable) M47

[TYPE 1] < FUNCTION DIAGNOSIS >

10. Yaw rate/side/decel G sensor B73

- 11. Rear wheel sensor LH C13
- 14. Stop lamp switch E38
- 12. Rear wheel sensor RH C13
- 15. Stop lamp relay E12

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Component Description

13. VDC OFF switch M154

Component parts		Reference
	Pump	PDC 42 "Description"
	Motor	BRC-42, "Description"
ABS actuator and electric unit (control unit)	Actuator relay	BRC-61, "Description"
7.20 dotation and discuss and (control anny)	Solenoid valve	BRC-53, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-75, "Description"
Wheel sensor		BRC-32, "Description"
Yaw rate/side/decel G sensor		BRC-45, "Description"
Steering angle sensor		BRC-66, "Description"
VDC OFF switch		BRC-84, "Description"
ABS warning lamp		BRC-87, "Description"
Brake warning lamp		BRC-88, "Description"
VDC OFF indicator lamp		BRC-89, "Description"
SLIP indicator lamp		BRC-90, "Description"
Front pressure sensor*		PDC 62 "Description"
Rear pressure sensor*		BRC-63, "Description"
Active booster*		BRC-78, "Description"
Delta stroke sensor*		BRC-81, "Description"

^{*:} With VK56DE only

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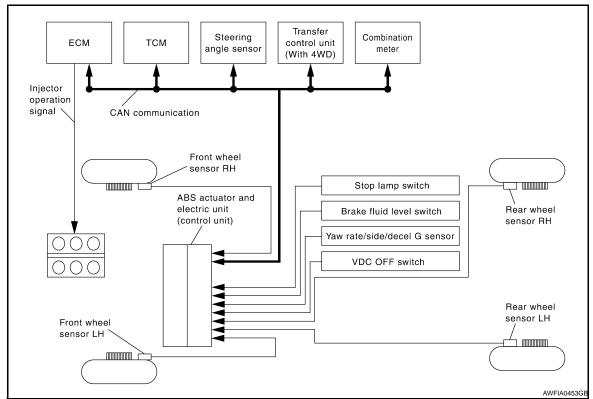
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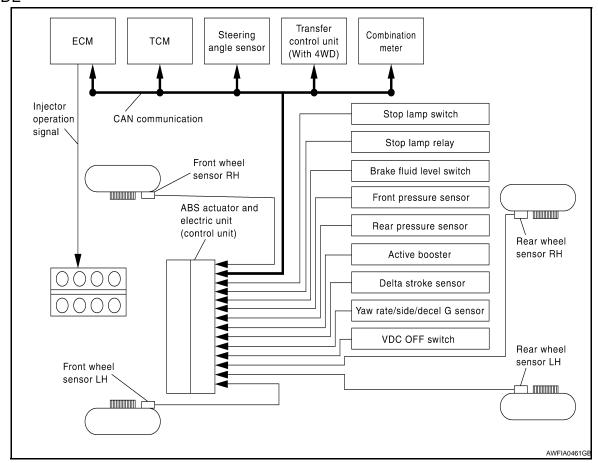
System Diagram

INFOID:0000000003937723

VQ40DE



VK56DE



System Description

• Traction Control System is a function that electronically controls engine torque, brake fluid pressure and A/T gear position to ensure the optimum slippage ratio at drive wheels by computing wheel speed signals from 4 wheel sensors. When ABS actuator and electric unit (control unit) detects a spin at drive wheels (rear wheels), it compares wheel speed signals from all 4 wheels. At this time, LH and RH rear brake fluid pressure are controlled, while fuel being cut to engine and throttle valve being closed to reduce engine torque by the control unit. Further more, throttle position is continuously controlled to ensure the optimum engine torque at all times.

• During TCS operation, it informs driver of system operation by flashing SLIP indicator lamp.

Electrical system diagnosis by CONSULT-III is available.

• Active booster, delta stroke sensor, front pressure sensor, rear pressure sensor and stop lamp relay are available on vehicles equipped with VK56DE only.

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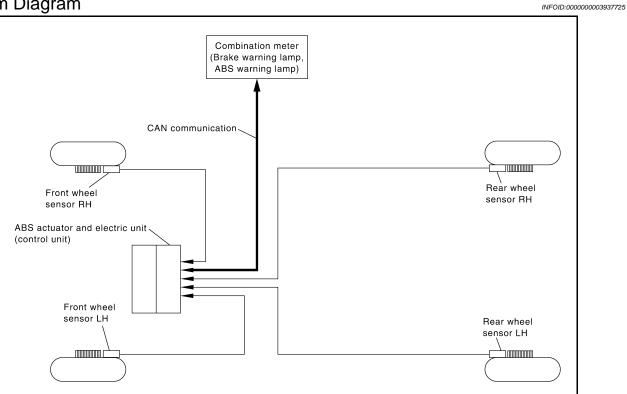
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ABS

System Diagram



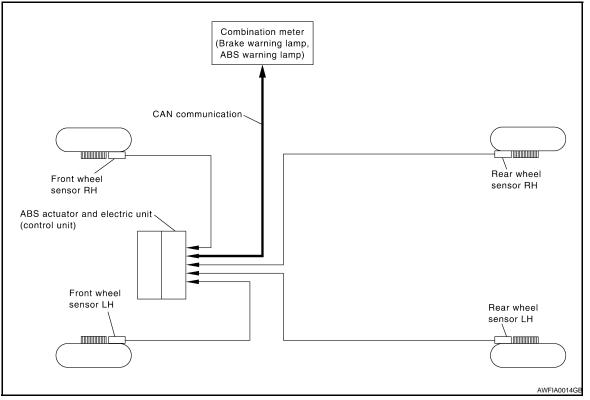
System Description

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- Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls
 braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.
- Electrical system diagnosis by CONSULT-III is available.

EBD

System Diagram



System Description

INFOID:0000000003937728

 Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.

• Electrical system diagnosis by CONSULT-III is available.

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< FUNCTION DIAGNOSIS >

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT-III Function (ABS)

INFOID:0000000003937729

[TYPE 1]

FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function		
Work support	Supports inspections and adjustments. Commands are transmitted to the ABS actuator and electric unit (control unit) for setting the status suitable for required operation, input/output signals are received from the ABS actuator and electric unit (control unit) and received data is displayed.		
Data monitor	Displays ABS actuator and electric unit (control unit) input/output data in real time.		
Active test	Operation of electrical loads can be checked by sending drive signals to them.		
Self-diagnostic result	Displays ABS actuator and electric unit (control unit) self-diagnosis results.		
CAN diag support monitor	The result of transmit/receive diagnosis of CAN communication can be read.		
ECU identification	ABS actuator and electric unit (control unit) part number can be read.		

SELF-DIAG RESULTS MODE

Operation Procedure

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How to Erase Self-diagnosis Results

 After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay "ON" position.

Display Item List

Refer to BRC-113, "DTC No. Index".

DATA MONITOR MODE

Display Item List

Item (Unit)	Dat	a monitor item sele		
	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position determined by TCM is displayed.
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.

[TYPE 1] < FUNCTION DIAGNOSIS >

Item	Data	monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is dis played.
N POSI SIG (ON/OFF)	-	-	×	Shift position (ON/OFF) judged by PNP switch signal.
P POSI SIG (ON/OFF)	-	-	×	Shift position (ON/OFF) judged by PNP switch signal.
ACCEL POS SIG %)	×	-	×	Throttle valve open/close status judged by CAN communication sig nal is displayed.
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.
STR ANGLE SIG (deg)	×	_	×	Steering angle detected by steering angle sensor is displayed.
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.
SIDE G-SENSOR (m/s ²)	×	-	×	Transverse acceleration detected by side G-sensor is displayed.
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.
ABS WARN LAMP ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) status is displayed.
SLIP LAMP ON/OFF)	-	×	×	SLIP indicator lamp (ON/OFF) status is displayed.
FR LH IN SOL ON/OFF)	-	×	×	Front LH IN ABS solenoid (ON/ OFF) status is displayed.
FR LH OUT SOL (ON/OFF)	-	×	×	Front LH OUT ABS solenoid (ON/ OFF) status is displayed.
RR RH IN SOL (ON/OFF)	-	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.
RR RH OUT SOL (ON/OFF)	-	×	×	Rear RH OUT ABS solenoid (ON/ OFF) status is displayed.
FR RH IN SOL ON/OFF)	-	×	×	Front RH IN ABS solenoid (ON/OFF) status is displayed.
FR RH OUT SOL (ON/OFF)	-	×	×	Front RH OUT ABS solenoid (ON/ OFF) status is displayed.
RR LH IN SOL ON/OFF)	-	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.
RR LH OUT SOL (ON/OFF)	-	×	×	Rear LH OUT ABS solenoid (ON/ OFF) status is displayed.
OFF LAMP (ON/OFF)	-	×	×	OFF Lamp (ON/OFF) status is displayed.
MOTOR RELAY (ON/OFF)	-	×	×	ABS motor relay signal (ON/OFF) status is displayed.
ACTUATOR RLY ON/OFF)	-	×	×	ABS actuator relay signal (ON/OFF status is displayed.

< FUNCTION DIAGNOSIS >

[TYPE 1]

Item	Data	monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
CV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (cut valve) (ON/OFF) status is displayed.
CV2 (ON/OFF)	-	-	×	Rear side switch-over solenoid valve (cut-valve) (ON/OFF) status is displayed.
SV1 (ON/OFF)	-	-	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
SV2 (ON/OFF)	-	-	×	Rear side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	-	-	×	VDC fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	-	-	×	TCS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	-	-	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	-	-	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	-	×	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	-	-	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	-	-	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	-	-	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	-	-	×	VDC operation (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	-	-	×	Brake warning lamp (ON/OFF) status is displayed.
SLCT LVR POSI (P, R, N, D)	×	×	×	Shift position judged by PNP switch signal.
R POSI SIG (ON/OFF)	-	-	×	Shift position judged by PNP switch signal.
2WD/4WD (2WD/4WD)	-	-	×	It recognizes on software whether it is 2WD and whether it is in 4WD state.
DECEL G-SEN* (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.
PRESS SENSOR** (bar)	×	_	×	Brake pressure detected by pressure sensor is displayed.
CRANKING SIG (ON/OFF)	-	-	×	The input state of the key SW START position signal is displayed.
PRESS SEN2** (bar)	-	-	×	Brake pressure detected by pressure sensor is displayed.
DELTA S SEN** (in.)	-	-	×	The amount of stroke sensor move ments in the active booster detected by DELTA S SEN is displayed.

< FUNCTION DIAGNOSIS > [TYPE 1]

Item	Data	a monitor item selec	ction	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
RELEASE SW NO** (ON/OFF)	_	-	×	Release switch signal (ON/OFF) status is displayed. "ON" indicates that the brake pedal is depressed. "OFF" is that the brake pedal is released.
RELEASE SW NC** (ON/OFF)	-	-	×	Release switch signal (ON/OFF) status is displayed. "OFF" indicates that the brake pedal is depressed on. "ON" is that the brake pedal is released.
OHB FAIL** (ON/OFF)	-	-	×	OHB fail status is displayed.
OHB SIG** (ON/OFF)	-	_	×	OHB operation (ON/OFF) status is displayed.

x: Applicable

ACTIVE TEST MODE

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.
- The active test cannot be performed with the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp or brake warning lamp on.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)
- "TEST IS STOPPED" is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" is displayed, to perform test again, touch BACK.

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/TCS function, select the item menu for each test item.
- For ABS solenoid valve, touch "Up", "Keep", and "Down" on the display screen. For ABS solenoid valve
 (ACT), touch "Up", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table
 below.

Operation -		AE	ABS solenoid valve			ABS solenoid valve (ACT)		
		Up	Keep	Down	Up	ACT UP	ACT KEEP	
FR RH SOL	FR RH IN SOL	Off	On	On	_	_	_	
TR KITSOL	FR RH OUT SOL	Off	Off	On*	_	_	_	
FR LH SOL	FR LH IN SOL	Off	On	On	_	_	_	
TREITSOL	FR LH OUT SOL	Off	Off	On*	_	_	_	
RR RH SOL	RR RH IN SOL	Off	On	On	_	_	_	
KK KIT SOL	RR RH OUT SOL	Off	Off	On*	_	_	_	
RR LH SOL	RR LH IN SOL	Off	On	On	_	_	_	
NN LII SOL	RR LH OUT SOL	Off	Off	On*	_	_	_	

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^{-:} Not applicable

^{*:} with VQ40DE

^{**:} with VK56DE

< FUNCTION DIAGNOSIS >

[TYPE 1]

Operation		AB	S solenoid va	alve	ABS	solenoid valv	e (ACT)
Operation		Up	Keep	Down	Up	ACT UP	ACT KEEP
ED DIL ADS SOLENOID (ACT)	FR RH IN SOL	_	_	_	Off	Off	Off
	FR RH OUT SOL	_	_	_	Off	Off	Off
FR RH ABS SOLENOID (ACT)	CV1	_	_	_	Off	On	On
	SV1	_	_	_	Off	On*	Off
	FR LH IN SOL	_	_	_	Off	Off	Off
	FR LH OUT SOL	_	_	_	Off	Off	Off
FR LH ABS SOLENOID (ACT)	CV1	_	_	_	Off	On	On
	SV1	_	_	_	Off	On*	Off
	RR RH IN SOL	_	_	_	Off	Off	Off
	RR RH OUT SOL	_	_	_	Off	Off	Off
RR RH ABS SOLENOID (ACT)	CV2	_	_	_	Off	On	On
	SV2	_	_	_	Off	On*	Off
	RR LH IN SOL	_	_	-	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	_	_	_	Off	Off	Off
	CV2	_	_	_	Off	On	On
	SV2	_	_	_	Off	On*	Off
REAR SOL	This item is not used for this model.						

^{*:} On for 1 to 2 seconds after the touch, and then Off

ABS MOTOR
• Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

APPLICATION NOTICE

< COMPONENT DIAGNOSIS > [TYPE 1]

COMPONENT DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2 HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description INFOID:000000003937731

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-32, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937733

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-129</u>, "Removal and Installation".

3. CHECK TIRES

Check for inflation pressure, wear and size of each tire.

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection and Service" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

 Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor		ABS actuator and electric unit (control unit)		Wheel sensor		
	Connector	Terminal	inal Connector Term			
Frantill		45	F40	1		
Front LH		46	E18	2		
Front DII		34	E117	1		
Front RH	E125 (with VQ40DE)	33		2	V	
Doorll	E127 (with VK56DE)	37		3	Yes	
Rear LH	36 C13	36	C13	4		
Door DII		42		1		
Rear RH		43		2		

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Repair the circuit.

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Component Inspection

INFOID:0000000003937734

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-32</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000003937735

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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INFOID:0000000004414761

C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-35, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

BRC-35

2.check wheel sensor output signal

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

 Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to <u>BRC-129</u>, "Removal and Installation".

3. CHECK TIRES

Check for inflation pressure, wear and size of each tire.

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection and Service" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

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6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

 Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity		
	Connector	Terminal	Connector	Terminal			
Front LH		45	E18	1			
FIORI LEI		46	E10	2			
Front RH	34	34	E117	1			
FIOIR KIT	E125 (with VQ40DE)	33	E117	2	2	Yes	
Rear LH	E127 (with VK56DE)	37		3	res		
Real LIT		36		4			
Rear RH		42		1			
ixtai ixi i		43		2			

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-35, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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INFOID:0000000003937740

C1109 POWER AND GROUND SYSTEM

Description INFOID:000000003937741

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
BATTERY VOLTAGE [ABNORMAL]	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-39, "Diagnosis Procedure (With VK56DE)".

NO >> Inspection End

Diagnosis Procedure (With VQ40DE)

INFOID:0000000003937743

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26, "CONSULT-III Function</u> (ABS)".

Is any item indicated on the self-diagnosis display?

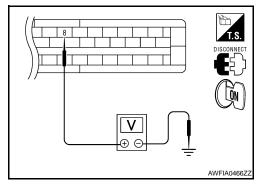
YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) POWER SUPPLY CIRCUIT AND GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Turn ignition switch ON and OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator a (contro		— Condition	Voltage	
Connector	Terminal			
F125	8	Ground	Ignition switch: ON	Battery voltage
L 125	0	Giodila	Ignition switch: OFF	Approx. 0V



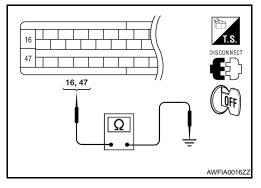
4. Turn ignition switch OFF.

< COMPONENT DIAGNOSIS >

[TYPE 1]

Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.

NO >> Repair or replace malfunctioning components.

Diagnosis Procedure (With VK56DE)

INFOID:0000000004414763

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

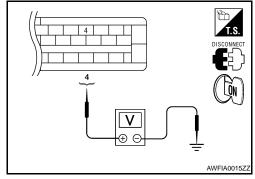
>> GO TO 2 YES

NO >> Poor connection of connector terminal. Repair or replace connector.

2.check abs actuator and electric unit (control unit) power supply circuit and **GROUND CIRCUIT**

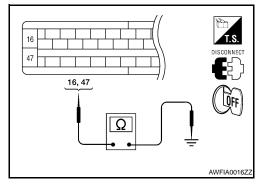
- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector. 2.
- Turn ignition switch ON and OFF and check voltage between ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator a (contro		— Condition		Voltage
Connector	Terminal			
F127	1	Ground	Ignition switch: ON	Battery voltage
L127	4	Ground	Ignition switch: OFF	Approx. 0V



- Turn ignition switch OFF.
- Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E127	16, 47	Ground	Yes



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BRC-39

C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

Is the inspection result normal?

YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.

NO >> Repair or replace malfunctioning components.

Special Repair Requirement

INFOID:0000000003937744

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) [TYPE 1] < COMPONENT DIAGNOSIS > C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) DTC Logic INFOID:0000000003937745

DTC DE	TECTION LOGIC					
DTC	Display item	Malfunction detected condition	Possible cause			
C1110	CONTROLLER FAILURE	When there is an internal malfunction in the ABS actuator and electric unit (control unit).	ABS actuator and electric unit (control unit)			
C1170	VARIANT CODING	In a case where VARIANT CODING is different.				
DTC CC	DTC CONFIRMATION PROCEDURE					
1. CHECK SELF-DIAGNOSIS RESULTS						

Self-diagnosis results **CONTROLLER FAILURE**

VARIANT CODING

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to <u>BRC-41</u>, "Diagnosis Procedure". YES

NO >> Inspection End

Check the self-diagnosis results.

Diagnosis Procedure

INSPECTION PROCEDURE

1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

>> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

Special Repair Requirement

 ${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel G sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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INFOID:0000000003937746

INFOID:0000000003937747

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000003937748

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1111	C1111 PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit	
OIIII	T GIVII WOTOR	During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	-
PUMP MOTOR	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-42, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937750

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

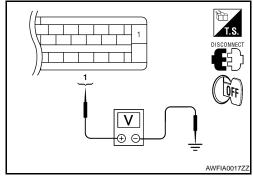
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

1. Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector
- Check voltage between the ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and ele	ABS actuator and electric unit (control unit)		Voltage
Connector	Terminal	_	voltage
E125 (with VQ40DE)	1	Ground	Battery voltage
E127 (with VK56DE)	,	Giodila	Battery voltage



[TYPE 1]

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

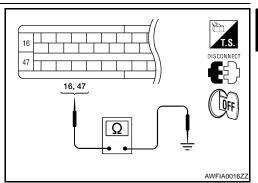
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
E125 (with VQ40DE)	16. 47	Ground	Yes
E127 (with VK56DE)	10, 47	Glound	165

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



Component Inspection

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-42, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

Description

The yaw rate/side/decel G sensor detects the yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1113	G-SENSOR	Longitudinal G-sensor is malfunctioning, or signal line of longitudinal G-sensor is open or shorted.	Harness or connector
C1145	YAW RATE SENSOR	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	ABS actuator and electric unit (control unit)
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	Yaw rate/side/decel G sensor

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
G-SENSOR
YAW RATE SENSOR
SIDE G-SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-45</u>, "<u>Diagnosis Procedure (With VQ40DE)</u>" or <u>BRC-46</u>, "<u>Diagnosis Procedure (With VK56DE)</u>".

NO >> Inspection End

Diagnosis Procedure (With VQ40DE)

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. when VDC function is OFF may cause the yaw rate/side/decel G sensor system to indicate a malfunction. This is not a malfunction if normal operation can be resumed after restarting the engine.
- If vehicle is on turn table at entrance to parking garage, or on other moving surface, VDC OFF indicator lamp may illuminate and CONSULT-III self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn table or other moving surface, and start engine. Results will return to normal.

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2 -YAW RATE/SIDE/DECEL G SENSOR HARNESS INSPECTION

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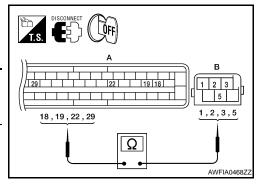
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

Check continuity between the ABS actuator and electric unit (control unit) connector E125 (A) and the yaw rate/side/decel G sensor connector B73 (B).

	ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor	
Connector	Terminal	Connector Terminal		
	18		2	
E125 (A)	19	D72 (D)	1	Yes
E125 (A)	22	B73 (B)	3	res
	29		5	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3. YAW RATE/SIDE/DECEL G SENSOR INSPECTION

- Connect the yaw rate/side/decel G sensor connector and ABS actuator and electric unit (control unit) connector.
- 2. Perform yaw rate/side/decel G sensor component inspection. Refer to <u>BRC-47</u>, "Component Inspection". Is the inspection result normal?
- YES >> Perform self-diagnosis again. If the same results appear, replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".
- NO >> Replace the yaw rate/side/decel G sensor. Refer to <u>BRC-135</u>, "Removal and Installation".

Diagnosis Procedure (With VK56DE)

INFOID:0000000004414790

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. when VDC function is OFF may cause the yaw rate/side/decel G sensor system to indicate a malfunction. This is not a malfunction if normal operation can be resumed after restarting the engine.
- If vehicle is on turn table at entrance to parking garage, or on other moving surface, VDC OFF indicator lamp may illuminate and CONSULT-III self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn table or other moving surface, and start engine. Results will return to normal.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.

Check the terminals for deformation, disconnection, looseness or damage.

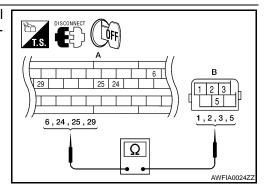
Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2. YAW RATE/SIDE/DECEL G SENSOR HARNESS INSPECTION

Check continuity between the ABS actuator and electric unit (control unit) connector E127 (A) and the yaw rate/side/decel G sensor connector B73 (B).



	ABS actuator and electric unit (control unit)		Yaw rate/side/decel G sensor		
Connector	Terminal	Connector Terminal			
	6		3		
E127 (A)	24	B73 (B)	5	Yes	
L127 (A)	25	B/3 (B)	1	res	
	29		2		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3.YAW RATE/SIDE/DECEL G SENSOR INSPECTION

- 1. Connect the yaw rate/side/decel G sensor connector and ABS actuator and electric unit (control unit) connector.
- 2. Perform yaw rate/side/decel G sensor component inspection. Refer to <u>BRC-47</u>, "Component Inspection". <u>Is the inspection result normal?</u>
- YES >> Perform self-diagnosis again. If the same results appear, replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".
- NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-135, "Removal and Installation".

Component Inspection

1. CHECK DATA MONITOR

Select "YAW RATE SEN", "SIDE G-SENSOR", "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal.

Vehicle condition	YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	DECEL G-SEN (DATA MONITOR)
Stopped	-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.11 G to +0.11 G
Turning right	Negative value	Negative value	-
Turning left	Positive value	Positive value	-
Speed up	-	-	Negative value
Speed down	-	-	Positive value

Is the inspection result normal?

YES >> Inspection End

NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-135, "Removal and Installation".

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel G sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1115 WHEEL SENSOR

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connector Wheel sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-48, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004414762

CAUTION:

Do not check between wheel sensor terminals.

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-129, "Removal and Installation".

3.CHECK TIRES

< COMPONENT DIAGNOSIS >

Check for inflation pressure, wear and size of each tire.

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle <u>Inspection and Service"</u> (front) or <u>RAX-5</u>, "On-Vehicle <u>Inspection and Service"</u> (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.

Δ 1 2 3 4 1 , 2 , 3 , 4 Ω Ω — AWFIA0464ZZ

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) connector and the malfunctioning wheel sensor connector.

Wheel sensor		S actuator and Wheel sensor unit (control unit)		nsor	Continuity
	Connector	Terminal	Connector	Terminal	
		45	45 46 E18	1	
Front LH		46		2	
Front RH	34	1			
FIOH KH	E125 (with VQ40DE)	33	E117	2	Yes
Rear LH	E127 (with VK56DE)	37		3	res
Neal LIT		36	C13	4	
Rear RH		42		1	
Keal Kn		43		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)
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< COMPONENT DIAGNOSIS >

FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-48, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003937762

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1116 STOP LAMP SWITCH

Description INFOID:000000003937763

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-51</u>, "<u>Diagnosis Procedure (With VQ40DE)</u>" or <u>BRC-51</u>, "<u>Diagnosis Procedure (With VK56DE)</u>".

NO >> Inspection End

Diagnosis Procedure (With VQ40DE)

INFOID:0000000004421994

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

$2.\mathsf{stop}$ lamp switch inspection

Check voltage between ABS actuator and electric unit (control unit) harness connector E125 terminal 39 and body ground.

Brake pedal depressed : Battery voltage

(approx. 12V)

Brake pedal not depressed: Approx. 0V

Is the inspection result normal?

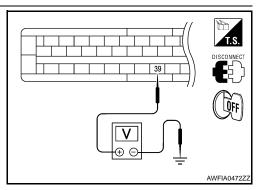
YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Diagnosis Procedure (With VK56DE)

1.CONNECTOR INSPECTION

1. Disconnect ABS actuator and electric unit (control unit) connector and stop lamp switch connector.



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< COMPONENT DIAGNOSIS >

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

$2.\mathsf{stop}$ lamp switch inspection

Check voltage between ABS actuator and electric unit (control unit) connector E127 terminal 41 and body ground.

Brake pedal depressed : Battery voltage

(approx. 12V)

Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> GO TO 3

3.stop Lamp relay circuit inspection

1. Disconnect stop lamp relay connector.

 Check continuity between stop lamp relay connector E12 (A) terminal 5 and ABS actuator and electric unit (control unit) connector E127 (B) terminal 41.

Continuity should exist.

Is the inspection result normal?

YES >> Refer to BRC-8, "Work Flow".

NO >> Repair or replace malfunctioning components.

DISCONNECT OFF B

INFOID:0000000003937766

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

C1120, C1122, C1124, C1126 IN ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
RR LH IN ABS SOL
RR RH IN ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-53, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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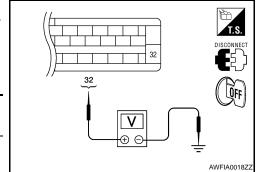
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INFOID:0000000003937769

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	_	voltage	
E125 (with VQ40DE)	VQ40DE) 32		Battery voltage	
E127 (with VK56DE)	32	Ground	Ballery vollage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector terminals 16, 47 and ground.

ABS actuator and ele	ctric unit (control unit)		Continuity	
Connector	Terminal	_		
E125 (with VQ40DE)	16. 47	Ground	Yes	
E127 (with VK56DE)	10, 47	Glound	165	

16, 47 16, 47 AWFIA0016ZZ

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003937770

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR KH SOL	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
	RR RH IN SOL	Off	On	On
RR RH SOL	RR RH OUT SOL	Off	Off	On*
DD I II COI	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
REAR SOL	AR SOL This item is not used for this model.			

^{*:} On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-53</u>, "<u>Diagnosis Procedure</u>".

C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS:	>
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[TYPE 1]

Special Repair Requirement

INFOID:0000000003937771

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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>> GO TO 2

>> END

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1121, C1123, C1125, C1127 OUT ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.	
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-56, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004421998

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

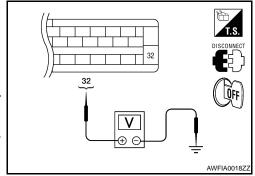
C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connec-
- 3. Check voltage between ABS actuator and electric unit (control unit) connector terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)		Voltage	
Connector	Terminal	_	voltage	
E125 (with VQ40DE)		Ground	Battery voltage	
E127 (with VK56DE)	32	Giodila	Ballery Vollage	



Is the inspection result normal?

YFS >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

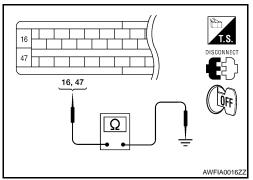
Check continuity between ABS actuator and electric unit (control unit) connector terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal	_		
E125 (with VQ40DE)	16. 47	Ground	Yes	
E127 (with VK56DE)	10, 47	Ground	res	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000004421999

Component Inspection 1. CHECK ACTIVE TEST

Select each test menu item on "ACTIVE TEST".

On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR KH SOL	FR RH OUT SOL	Off	Off	On*
ED I II OOI	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
DD D11 001	RR RH IN SOL	Off	On	On
RR RH SOL	RR RH OUT SOL	Off	Off	On*
DD III COI	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
REAR SOL	This item is not used for this	This item is not used for this model.		

^{*:} On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-56, "Diagnosis Procedure". **BRC**

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C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 1]

Special Repair Requirement

INFOID:0000000003937776

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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INFOID:0000000003937779

INFOID:0000000003937780

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description

ABS actuator and electric unit (control unit) and ECM exchange the engine signal with CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1130	ENGINE SIGNAL 1			
C1131	ENGINE SIGNAL 2	Based on the signal from ECM, ABS actuator and electric unit (control unit) judges that engine fuel cut system is malfunctioning.	Harness or connectorABS actuator and electric unit	
C1132	ENGINE SIGNAL 3		(control unit)	
C1133	ENGINE SIGNAL 4			ECM CAN communication line
C1136	ENGINE SIGNAL 6		2 22 	

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-59, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. CHECK ENGINE SYSTEM

1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-73, "CONSULT-III Function (ENGINE)" (VQ40DE) or EC-546, "CONSULT-III Function (ENGINE)" (VK56DE).

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-26, "CONSULT-III Func-tion (ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> Inspection End

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

BRC-59

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 1]

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

INFOID:0000000004422008

C1140 ACTUATOR RLY

Description INFOID:0000000003937781

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-61, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn ignition switch OFF.
 Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26, "CONSULT-III Function (ABS)".</u>

Is any item indicated on the self-diagnosis display?

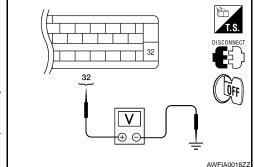
YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector terminal 32 and ground.

ABS actuator and electric unit (control unit)			Voltage
Connector	Terminal	_	voltage
E125 (with VQ40DE)	32	Ground	Battery voltage
E127 (with VK56DE)	32	Ground	Ballery vollage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

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< COMPONENT DIAGNOSIS >

Check continuity between ABS actuator and electric unit (control unit) connector terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector Terminal		_	Continuity
E125 (with VQ40DE)	16 47	Ground	Yes
E127 (with VK56DE)	E127 (with VK56DE)		res

16, 47 16, 47 AWFIA0016ZZ

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003937784

1. CHECK ACTIVE TEST

- 1. On "ACTIVE TEST", select "ABS MOTOR".
- 2. Touch On and Off on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-61</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000003937785

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

C1142 PRESS SENSOR

Description

The front and rear pressure sensors convert the brake fluid pressure to an electric signal and transmit it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1142	PRESS SEN CIRCUIT	Pressure sensor signal line is open or shorted, or pressure sensor is malfunctioning.	Harness or connector Pressure sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PRESS SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-63</u>, "<u>Diagnosis Procedure (With VK56DE)</u>".

NO >> Inspection End

Diagnosis Procedure (With VK56DE)

INFOID:0000000003937788

FRONT PRESSURE SENSOR

1. CONNECTOR INSPECTION

- 1. Turn the ignition switch OFF.
- 2. Disconnect the front pressure sensor connector and ABS actuator and electric unit (control unit) connector and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

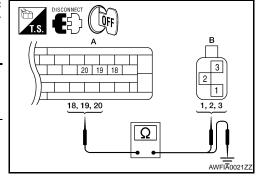
YES >> GO TO 2

NO >> Repair connector.

2.FRONT PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) connector E127 (A) and front pressure sensor connector E31 (B).

ABS actuator and electric unit (control unit)		Front pres	sure sensor	Continuity
Connector	Terminal	Connector	Terminal	
	18		3	
E127 (A)	19	E31 (B)	1	Yes
	20		2	



2. Measure the continuity between the ABS actuator and electric unit (control unit) connector E127 (A) and body ground.

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ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	18		
E127 (A)	19	Ground	No
	20		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3. FRONT PRESSURE SENSOR INSPECTION

- 1. Reconnect the front pressure sensor and ABS actuator and electric unit (control unit) connectors.
- Perform the front pressure sensor (PRESS SENSOR) component inspection. Refer to <u>BRC-65, "Component Inspection"</u>.

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace the front pressure sensor.

REAR PRESSURE SENSOR

1.CONNECTOR INSPECTION

- Turn the ignition switch OFF.
- Disconnect the rear pressure sensor connector and ABS actuator and electric unit (control unit) connector and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

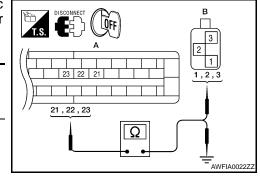
YES >> GO TO 2

NO >> Repair connector.

2.REAR PRESSURE SENSOR CIRCUIT INSPECTION

 Measure the continuity between the ABS actuator and electric unit (control unit) connector E127 (A) and rear pressure sensor connector E32 (B).

	and electric unit ol unit)	unit Rear pressure sensor		Continuity
Connector	Terminal	Connector	Terminal	
	21		1	
E127 (A)	22	E32 (B)	3	Yes
	23		2	



Measure the continuity between the ABS actuator and electric unit (control unit) connector E127 (A) and body ground.

ABS actuator and electric unit (control unit)		_	Continuity	
Connector	Terminal			
	21			
E127 (A)	22	Ground	No	
	23			

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

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3. REAR PRESSURE SENSOR INSPECTION

- 1. Reconnect the rear pressure sensor and ABS actuator and electric unit (control unit) connectors.
- Perform the rear pressure sensor (PRESS SEN2) component inspection. Refer to <u>BRC-65</u>, "Component Inspection".

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace the ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".
- NO >> Replace the rear pressure sensor.

Component Inspection

INFOID:0000000003937789

1. CHECK DATA MONITOR

On "DATA MONITOR", select "PRESS SENSOR" and "PRESS SEN2" and check the brake fluid pressure.

Condition	PRESS SENSOR and PRESS SEN2 (DATA MONITOR)
With ignition switch turned ON and brake pedal released.	Approx. 0 bar
With ignition switch turned ON and brake pedal depressed.	Positive value

Is the inspection result normal?

YES >> Inspection End

NO >> Replace the appropriate pressure sensor. Refer to BR-47, "Disassembly and Assembly".

Special Repair Requirement

INFOID:0000000003937790

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION : Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1143, C1144 STEERING ANGLE SENSOR

Description

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	Harness or connector Steering angle sensor
C1144	ST ANG SEN SIGNAL	Neutral position of steering angle sensor is not finished.	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT
ST ANG SEN SIGNAL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-66, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937793

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26, "CONSULT-III Function (ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.check steering angle sensor harness

- Turn ignition switch OFF.
- Disconnect steering angle sensor connector.

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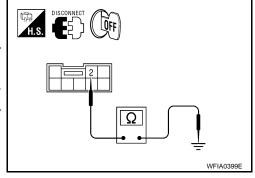
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Check continuity between steering angle sensor connector M47 terminal 2 and ground.

Steering angle sensor		_	Continuity
Connector	Terminal		Continuity
M47	2	Ground	Yes



Turn ignition switch ON.

Check voltage between steering angle sensor connector M47 terminal 3 and ground.

Steering angle sensor		Voltage
Terminal		voltage
3	Ground	Battery voltage
		Terminal

Is the inspection result normal?

YFS >> GO TO 3

NO >> Repair or replace malfunctioning components.

3. CHECK DATA MONITOR

- Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
- Perform the steering angle sensor component inspection. Refer to BRC-67, "Component Inspection".

Is the inspection result normal?

- YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".
- NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-134, "Removal and Installation".

Component Inspection

1. CHECK DATA MONITOR

Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	0±2.5 °
Turn 90 ° to left	Approx. +90 °
Turn 90 ° to right	Approx. –90 °

Is the inspection result normal?

YFS >> Inspection End NO

>> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-134. "Removal and Installation".

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 1]

2.calibration of decel g sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000003937797

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000003937798

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	Harness or connector Brake fluid level switch Brake fluid level

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results **BR FLUID LEVEL LOW**

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-69, "Diagnosis Procedure (With VQ40DE)" or YES BRC-70, "Diagnosis Procedure (With VK56DE)".

NO >> Inspection End

Diagnosis Procedure (With VQ40DE)

1.CONNECTOR INSPECTION

- Disconnect ABS actuator and electric unit (control unit) connector and brake fluid level switch connector.
- Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC **UNIT (CONTROL UNIT)**

Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 28 and brake fluid level switch connector E21 (B) terminal 1.

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	28	E21 (B)	1	Yes

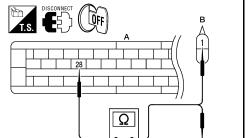
2. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 28 and gr

unit) connector E 125 (A) terminal 28 and ground.				
ABS actuator and electric unit (control unit) Continuity				ı
Connector Terminal		_	Continuity	
F125 (A)	28	Ground	No	

Is the inspection result normal?

>> GO TO 3 YES

E125 (A)



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INFOID:0000000003937799

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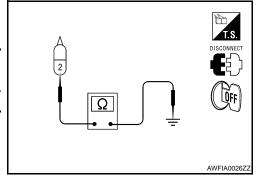
< COMPONENT DIAGNOSIS >

NO >> Repair or replace malfunctioning components.

3. CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check continuity between brake fluid level switch connector E21 terminal 2 and ground.

Brake fluid	level switch		Continuity
Connector	Terminal		Continuity
E21	2	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4. CHECK BRAKE FLUID LEVEL SWITCH

Perform brake fluid level switch component inspection. Refer to <u>BRC-71, "Component Inspection"</u>. Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace brake fluid level switch.

Diagnosis Procedure (With VK56DE)

INFOID:0000000004422011

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and brake fluid level switch connector.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

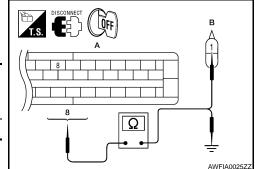
NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

 Check continuity between ABS actuator and electric unit (control unit) connector E127 (A) terminal 8 and brake fluid level switch connector E21 (B) terminal 1.

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
E127 (A)	8	E21 (B)	1	Yes

Check continuity between ABS actuator and electric unit (control unit) connector E127 (A) terminal 8 and ground.



ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal		Continuity
E127 (A)	8	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK BRAKE FLUID LEVEL SWITCH GROUND

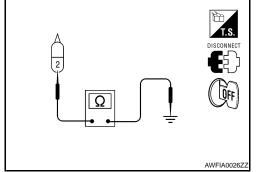
C1155 BRAKE FLUID LEVEL SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 1]

Check continuity between brake fluid level switch connector E21 terminal 2 and ground.

Brake fluid level switch			Continuity
Connector	Terminal	_	Continuity
E21	2	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

4. CHECK BRAKE FLUID LEVEL SWITCH

Perform brake fluid level switch component inspection. Refer to <u>BRC-71, "Component Inspection"</u>. Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

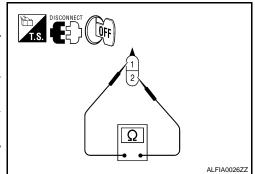
NO >> Replace brake fluid level switch.

Component Inspection

1. CHECK BRAKE FLUID LEVEL SWITCH

- Turn ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1-2	When brake fluid is full in the reservoir tank.	No	
1 – 2	When brake fluid is empty in the reservoir tank.	Yes	
le the increation result represely			



Is the inspection result normal?

YES >> Inspection End

NO >> Replace brake fluid level switch.

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-13</u>, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1156 ST ANG SEN COM CIR

Description INFOID:0000000003937802

The steering angle sensor is connected to the ABS actuator and electric unit (control unit) in addition to CAN lines. CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1156	ST ANG SEN COM CIR	When steering angle sensor is not transmitting CAN communication signal to the ABS actuator and electric unit (control unit).	 Harness or connector CAN communication line Steering angle sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ST ANG SEN COM CIR	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-72, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937804

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector, check terminals for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminals.
- 2. Reconnect connector and perform self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)".

Self-diagnosis results
CAN COMM CIRCUIT
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Inspection End

2. PERFORM SELF-DIAGNOSIS AGAIN

- 1. Turn the ignition switch to OFF and then to ON and erase self-diagnosis results.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis again.

Are any self-diagnosis results displayed?

YES >> Replace yaw rate/side/decel G sensor. Refer to BRC-135, "Removal and Installation".

NO >> Inspection End

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INFOID:0000000003937810

C1163 ST ANGLE SEN SAFE

Description INFOID:0000000003937808

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

 Self-diagnosis results
ST ANGL SEN SAFE

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-74, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to <u>BRC-12</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: <u>Description</u>".

>> GO TO 2

2.INDICATOR LAMP CHECK

Check that VDC OFF indicator lamp is off.

Is VDC OFF indicator lamp off?

YES >> Inspection End

NO

>> Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-26</u>, "<u>CONSULT-III Function (ABS)</u>".

BRC-74

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INFOID:0000000004422000

C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:000000003937811

CV1, CV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

SV1, SV2 (SUCTION VALVE)

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	
C1165	CV2	VDC switch-over solenoid valve (CV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector ABS actuator and electric unit
C1166	SV1	VDC switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	(control unit)
C1167	SV2	VDC switch-over solenoid valve (SV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-75, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-26</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

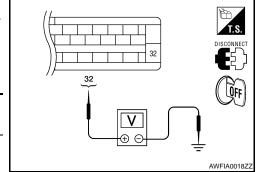
NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

BRC-75

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) connector terminal 32 and ground.

ABS actuator and ele	ctric unit (control unit)		Voltage	
Connector	Connector Terminal		voltage	
E125 (with VQ40DE)	32	Ground	Battery voltage	
E127 (with VK56DE)	E127 (with VK56DE)		battery voltage	



Is the inspection result normal?

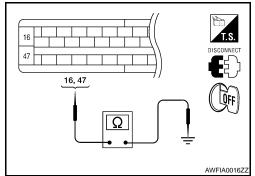
YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

Check continuity between ABS actuator and electric unit (control unit) connector terminals 16, 47 and ground.

ABS actuator and ele	ctric unit (control unit)		Continuity	
Connector	Terminal	_		
E125 (with VQ40DE)	16. 47	Ground	Yes	
E127 (with VK56DE)	10, 47	Glouila	163	



Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000004422001

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- 2. On the display, touch "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Operation		A	ABS solenoid valve (ACT)		
		Up	ACT UP	ACT KEEP	
	FR RH IN SOL	Off	Off	Off	
ED DILLARS SOLEMOID (ACT)	FR RH OUT SOL	Off	Off	Off	
FR RH ABS SOLENOID (ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	FR LH IN SOL	Off	Off	Off	
ED LILADO COLENOID (ACT)	FR LH OUT SOL	Off	Off	Off	
FR LH ABS SOLENOID (ACT)	CV1	Off	On	On	
	SV1	Off	On*	Off	
	RR RH IN SOL	Off	Off	Off	
RR RH ABS SOLENOID (ACT)	RR RH OUT SOL	Off	Off	Off	
	CV2	Off	On	On	
	SV2	Off	On*	Off	

C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 1]

INFOID:0000000003937815

Operation		ABS solenoid valve (ACT)		
		Up	ACT UP	ACT KEEP
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
REAR SOL	This item is not used for this model.		1	

^{*:} On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-75, "Diagnosis Procedure".

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

Description INFOID:000000003937817

The active brake booster consists of a vacuum booster, an active booster control group and a delta stroke sensor. If a brake booster system malfunction occurs due to loss of vacuum, the delta stroke sensor will signal the ABS actuator and electric unit (control unit) that a booster malfunction has occurred. The active booster then applies supplemental force to the master cylinder relative to the amount of force exerted on the brake pedal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1178	ABS ACTIVE BOOSTER SV NG	Active booster solenoid is malfunctioning, or signal line of active booster servo is open or shorted.	
C1181	ABS ACTIVE BOOSTER RE- SPONSE NG	Active booster response is malfunctioning, or signal line of active booster response is open or shorted.	Harness or connector Active booster
C1184	ABS BRAKE RELEASE SW NG	Brake release switch is malfunctioning, or signal line of brake release switch is open or shorted.	ABS actuator and electric unit (control unit)
C1189	ABS BRAKE BOOSTER DE- FECT	Brake booster is defective or malfunctioning.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ABS ACTIVE BOOSTER SV NG
ABS ACTIVE BOOSTER RESPONSE NG
ABS BRAKE RELEASE SW NG
ABS BRAKE BOOSTER DEFECT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-78, "Diagnosis Procedure (With VK56DE)".

NO >> Inspection End

Diagnosis Procedure (With VK56DE)

INFOID:0000000003937819

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- Turn the ignition switch OFF.
- Disconnect the active booster connector and ABS actuator and electric unit (control unit) connector and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair connector.

2.ACTIVE BOOSTER CIRCUIT INSPECTION

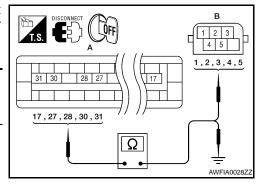
C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

< COMPONENT DIAGNOSIS >

[TYPE 1]

Measure the continuity between ABS actuator and electric unit (control unit) connector E127 (A) and active booster connector E49 (B).

ABS actuator and electric unit (control unit)		Active booster		Continuity
Connector	Connector Terminal		Terminal	
	17		3	
	27		1	
E127 (A)	28	E49 (B)	5	Yes
	30		2	
	31		4	



Measure the continuity between ABS actuator and electric unit (control unit) connector E127 (A) and ground.

	electric unit (control nit)	_	Continuity	
Connector Terminal				
	17			
	27	Ground	No	
E127 (A)	28			
	30			
	31			

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.ACTIVE BOOSTER INSPECTION

- Reconnect the active booster and ABS actuator and electric unit (control unit) connectors.
- Perform the active booster component inspection. Refer to BRC-79, "Component Inspection".

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace the active booster. Refer to <u>BR-34, "Removal and Installation"</u>.

Component Inspection

1. CHECK DATA MONITOR

Use "DATA MONITOR" to check if the status of "RELEASE SWITCH NO" and "RELEASE SWITCH NC" is normal.

Condition	RELEASE SWITCH NO (DATA MONITOR)	RELEASE SWITCH NC (DATA MONITOR)
When brake pedal is depressed.	ON	OFF
When brake pedal is released.	OFF	ON

Is the inspection result normal?

YES >> Inspection End

NO >> Replace the active booster. Refer to BR-34, "Removal and Installation".

Special Repair Requirement

 $oldsymbol{1}$.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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C1178, C1181, C1184, C1189 ABS ACTIVE BOOSTER

< COMPONENT DIAGNOSIS >

[TYPE 1]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1179 ABS DELTA S SEN NG

Description INFOID:0000000003937822

The active brake booster consists of a vacuum booster, an active booster control group and a delta stroke sensor. If a brake booster system malfunction occurs due to loss of vacuum, the delta stroke sensor will signal the ABS actuator and electric unit (control unit) that a booster malfunction has occurred. The active booster then applies supplemental force to the master cylinder relative to the amount of force exerted on the brake pedal.

DTC Logic INFOID:0000000003937823

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1179	ABS DELTA S SEN NG	Delta stroke sensor is malfunctioning, or signal line of delta stroke sensor is open or shorted.	Harness or connector Delta stroke sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	_
ABS DELTA S SEN NG	_

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-81, "Diagnosis Procedure (With VK56DE)".

NO >> Inspection End

Diagnosis Procedure (With VK56DE)

1. CONNECTOR INSPECTION

Turn the ignition switch OFF.

Disconnect the delta stroke sensor connector and ABS actuator and electric unit (control unit) connector and inspect the terminals for deformation, disconnection, looseness, or damage.

Is the inspection result normal?

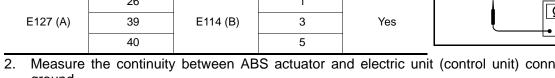
YES >> GO TO 2

NO >> Repair connector.

2.DELTA STROKE SENSOR CIRCUIT INSPECTION

Measure the continuity between ABS actuator and electric unit (control unit) connector E127 (A) and delta stroke sensor connector E114 (B).

	and electric unit ol unit)	Delta stroke sensor		Continuity
Connector	Terminal	Connector	Terminal	
	26		1	
E127 (A)	39	E114 (B)	3	Yes
	40		5	



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Measure the continuity between ABS actuator and electric unit (control unit) connector E127 (A) and ground.

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ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
	26		
E127 (A)	39	Ground	No
	40		

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness or connector.

3.Delta stroke sensor inspection

- Reconnect the delta stroke sensor and ABS actuator and electric unit (control unit) connectors.
- Perform the delta stroke sensor component inspection. Refer to <u>BRC-82, "Component Inspection"</u>.

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace the delta stroke sensor. Refer to BR-34, "Removal and Installation".

Component Inspection

INFOID:0000000003937825

1. CHECK DATA MONITOR

Use "DATA MONITOR" to check if the status of "DELTA S SEN" is normal.

Condition	DELTA S SEN (DATA MONITOR)
When brake pedal is depressed.	1.05–1.80 mm
When brake pedal is released.	0.00 mm (+0.6/-0.4)

Is the inspection result normal?

YES >> Inspection End

NO >> Replace the delta stroke sensor. Refer to BR-34, "Removal and Installation".

Special Repair Requirement

INFOID:0000000003937826

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

U1000 CAN COMM CIRCUIT

Description INFOID:0000000003937827

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic INFOID:0000000003937828

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	

Diagnosis Procedure

INFOID:0000000003937829

INSPECTION PROCEDURE

1. CHECK CONNECTOR

Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.

Reconnect connector and perform self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

>> Print out the self-diagnostic results, and refer to LAN-14. "Trouble Diagnosis Flow Chart",

NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

INFOID:0000000003937830

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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INFOID:0000000003937832

INFOID:0000000003937833

VDC OFF SWITCH

Description INFOID:0000000003937831

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

1. CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-84, "Diagnosis Procedure (With VQ40DE)" or BRC-85, "Diagnosis Procedure (With VK56DE)".

Diagnosis Procedure (With VQ40DE)

1. CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to BRC-86, "Component Inspection".

Is the inspection result normal?

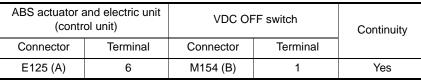
YES >> GO TO 2

NO >> Replace VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connec-
- 2. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and VDC OFF switch connector M154 (B) terminal 1.

	and electric unit ol unit)	VDC OFF switch		Continuity	
Connector	Terminal	Connector	Terminal		
E125 (A)	6	M154 (B)	1	Yes	



Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and ground.

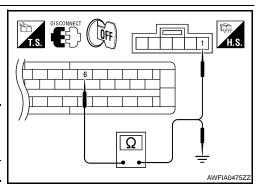
ABS actuator and electric unit (control unit)			Continuity
Connector	Terminal	_	Continuity
E125 (A)	6	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

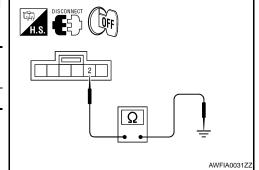
3.CHECK VDC OFF SWITCH GROUND



< COMPONENT DIAGNOSIS >

Check continuity between VDC OFF switch connector M154 and ground.

VDC OFF switch		_	Continuity
Connector	Terminal	_	Continuity
M154	2	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

Diagnosis Procedure (With VK56DE)

1. CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to <u>BRC-86</u>, "Component Inspection". <u>Is the inspection result normal?</u>

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2. CHECK VDC OFF SWITCH HARNESS

- Disconnect ABS actuator and electric unit (control unit) connector
- Check continuity between ABS actuator and electric unit (control unit) connector E127 (A) terminal 38 and VDC OFF switch connector M154 (B) terminal 1.

	and electric unit ol unit)	VDC OFF switch		Continuity	
Connector	Terminal	Connector	Terminal		
E127 (A)	38	M154 (B)	1	Yes	

3. Check continuity between ABS actuator and electric unit (control unit) connector E127 (A) terminal 38 and ground.

	T.S. CFF H.S.
ı)) 38 <u>Ω</u> =
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ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		Continuity
E127 (A)	38	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND

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< COMPONENT DIAGNOSIS >

Check continuity between VDC OFF switch connector M154 and ground.

VDC OFF switch		_	Continuity
Connector	Terminal		Continuity
M154	2	Ground	Yes

DISCONNECT OFF

Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

Component Inspection

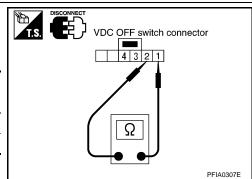
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INSPECTION PROCEDURE

1. CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- 3. Check continuity between VDC OFF switch terminals.

VDC OFF switch	Condition	Continuity
Terminal	Condition	Continuity
1 – 2	When VDC OFF switch is pressed.	Yes
1 – 2	When VDC OFF switch is released.	No



Is the inspection result normal?

YES >> Inspection End

NO >> Replace VDC OFF switch.

ABS WARNING LAMP

Description INFOID:000000003937835

×: ON –: OFF

INFOID:0000000003937836

INFOID:0000000003937837

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Condition	ABS warning lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-87. "Diagnosis Procedure".

Diagnosis Procedure

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-26</u>, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131, "Removal and Installation"</u>.

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

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BRAKE WARNING LAMP

Description

×: ON –: OFF

Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
Ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- 2: After starting engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000003937839

1.BRAKE WARNING LAMP OPERATION CHECK

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-88, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003937840

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

VDC OFF INDICATOR LAMP

Description INFOID:0000000003937841

 \times : ON -: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
VDC OFF switch turned ON. (VDC function is OFF.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003937842

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

>> GO TO 2 YES

NO >> Go to diagnosis procedure. Refer to BRC-89, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> Inspection End

NO >> Check VDC OFF switch. Refer to BRC-84, "Diagnosis Procedure (With VQ40DE)" or BRC-85, "Diagnosis Procedure (With VK56DE)".

Diagnosis Procedure

INFOID:0000000003937843

1. CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check VDC OFF switch. Refer to BRC-84, "Diagnosis Procedure (With VQ40DE)" or BRC-85, "Diagnosis Procedure (With VK56DE)".

2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-131, "Removal and Installa-

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation". **BRC**

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SLIP INDICATOR LAMP

Description INFOID:000000003937844

 \times : ON -: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003937845

1. CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-90. "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003937846

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-26, "CONSULT-III Function (ABS)"</u>.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94. "Removal and Installation".

APPLICATION NOTICE

< ECU DIAGNOSIS > [TYPE 1]

ECU DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

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Reference Value

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

		Data monitor		
Monitor item	Display content	Condition	Reference value in normal operation	
		0 [km/h (MPH)]	Vehicle stopped	
FR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
FR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
		0 [km/h (MPH)]	Vehicle stopped	
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)	
CTOD LAMP CW	Otan lana suitab simal atatus	When brake pedal is depressed	ON	
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is released	OFF	
BATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V	
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5	
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D	
OFF CW	VDC OFF aviitab ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON	
OFF SW	VDC OFF switch ON/OFF	VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF	
YAW RATE SEN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s	
IAW NAIE SEN	sensor	When vehicle turning	-75 to 75 d/s	
ACCEL POS SIG	Throttle actuator opening/closing is dis-	Accelerator pedal not depressed (ignition switch is ON)	0 %	
AUGEL PUS SIG	played (linked with accelerator pedal)	Accelerator pedal depressed (ignition switch is ON)	0 - 100 %	
		Vehicle stopped	Approx. 0 m/s ²	
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s ²)	
		Vehicle turning left	Positive value (m/s²)	

	Display content	Data monitor		
Monitor item		Condition	Reference value in normal operation	
OTD ANOLE OLO	Steering angle detected by steering angle	Straight-ahead	Approx. 0±2.5°	
STR ANGLE SIG	sensor	Steering wheel turned	-720 to +720°	
DDESC SENSOD	Brake fluid pressure detected by front pressure sensor	With ignition switch turned ON and brake pedal released	Approx. 0 bar	
PRESS SENSOR		With ignition switch turned ON and brake pedal depressed	-40 to 300 bar	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accor- dance with tachome ter display	
	5	When brake fluid level switch ON	ON	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF	
FR RH IN SOL	Operation status of each colonoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR RH IN SOL	N SOL Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
FR RH OUT SOL	OUT SOL Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED I II IN COI	IN SOL Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED I II OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH 001 50L		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR RH IN SOL	IN SOL Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
IXIX IXIT IIN 3 OL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
	Operation status of each action and value	Actuator (solenoid valve) is active ("ACTIVE TEST" with CONSULT-III) or actual tor relay is inactive (in fail-safe mode)	ON	
RR RH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
RR LH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
KK LH IN SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
DD LU QUT COI	Operation status of each coloneid value	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
RR LH OUT SOL	Operation status of each solenoid valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
MOTOR RELAT	Wotor and motor relay operation	When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator relay exerction	When the actuator relay is operating	ON
ACTUATOR RLY	Actuator relay operation	When the actuator relay is not operating	OFF
ADC MADNI AMD	ABS warning lamp	When ABS warning lamp is ON	ON
ABS WARN LAMP	(Note 3)	When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON
OFF LAMP	(Note 3)	When VDC OFF indicator lamp is OFF	OFF
SLIP LAMP	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
SLIP LAIVIP	(Note 3)	When SLIP indicator lamp is OFF	OFF
EBD SIGNAL	EBD operation	EBD is active	ON
LDD SIGNAL	LDD operation	EBD is inactive	OFF
ABS SIGNAL	ABS operation	ABS is active	ON
ADS SIGNAL	ABS operation	ABS is inactive	OFF
TCS SIGNAL	TCS operation	TCS is active	ON
103 SIGNAL	103 operation	TCS is inactive	OFF
VDC SIGNAL	VDC operation	VDC is active	ON
VDC SIGNAL	VDG operation	VDC is inactive	OFF
EBD FAIL SIG	EPD fail cofe signal	In EBD fail-safe	ON
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF
ABS FAIL SIG	ABS fail-safe signal	In ABS fail-safe	ON
ADO I AIL OIG	ADD Tall-Sale Signal	ABS is normal	OFF
TCS FAIL SIG	TCS fail-eafa signal	In TCS fail-safe	ON
103 FAIL SIG	TCS fail-safe signal	TCS is normal	OFF
VDC FAIL SIG	VDC fail-safe signal	In VDC fail-safe	ON
VDO I AIL SIG	VDO Idii-Sale Sigilal	VDC is normal	OFF
CDANKING SIG	Crank operation	Crank is active	ON
CRANKING SIG	Crank operation	Crank is inactive	OFF

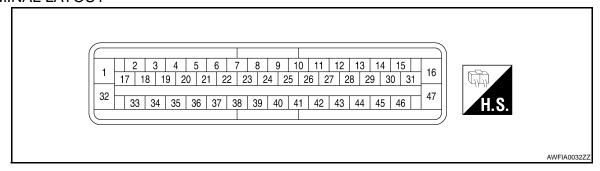
		Data monitor	1
Monitor item	Display content	Condition	Reference value in normal operation
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
DECEL O CEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON
EDD WARN LAWP	(Note 3)	When EBD warning lamp is OFF	OFF
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON
11 001 010	THE SWILLT SIGNAL CITY OF THE CONTRICT	A/T shift position = other than N position	OFF
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
	The state of the s	A/T shift position = other than P position	OFF
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
	3	A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
		4WD model	4WD
PRESS SEN2	Brake fluid pressure detected by rear pres-	With ignition switch turned ON and brake pedal released	Approx. 0 bar
	sure sensor	With ignition switch turned ON and brake pedal depressed	-40 to 300 bar
DELTA S SEN	Value detected by delta stroke sensor	When brake pedal is depressed	1.05 - 1.80 mm
		When brake pedal is released	0.00 mm (+0.6/-0.4)
RELEASE SWITCH NO	Active booster signal status	When brake pedal is depressed	ON
		When brake pedal is released	OFF
RELEASE SWITCH NC	Active booster signal status	When brake pedal is depressed	OFF
INO		When brake pedal is released	ON

< ECU DIAGNOSIS > [TYPE 1]

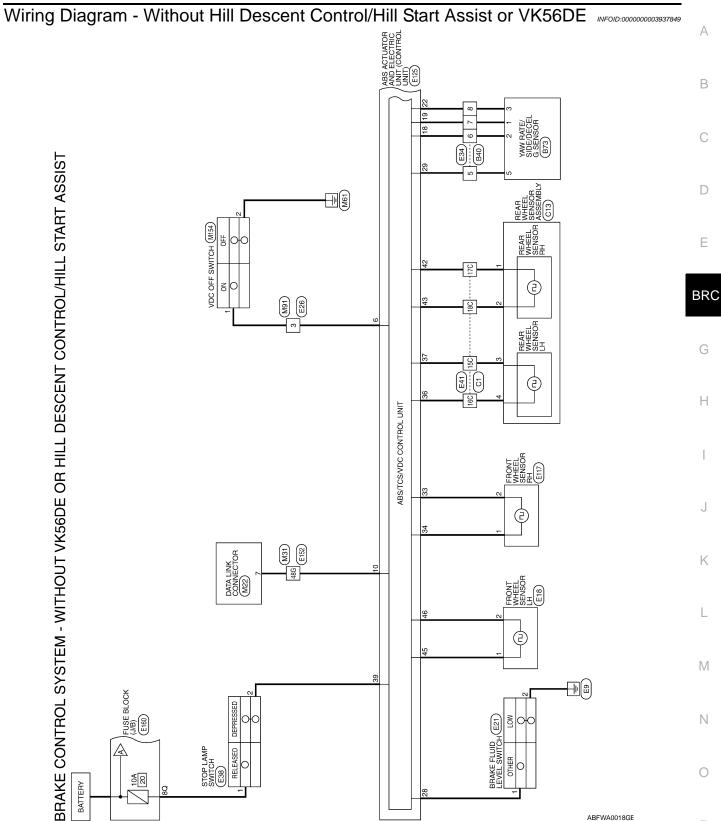
NOTE:

- 1: Confirm tire pressure is normal.
- 2: Only 4WD models.
- 3: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-87, "Description".
- Brake warning lamp: Refer to BRC-88, "Description".
- VDC OFF indicator lamp: Refer to BRC-89, "Description".
- SLIP indicator lamp: Refer to BRC-90, "Description".

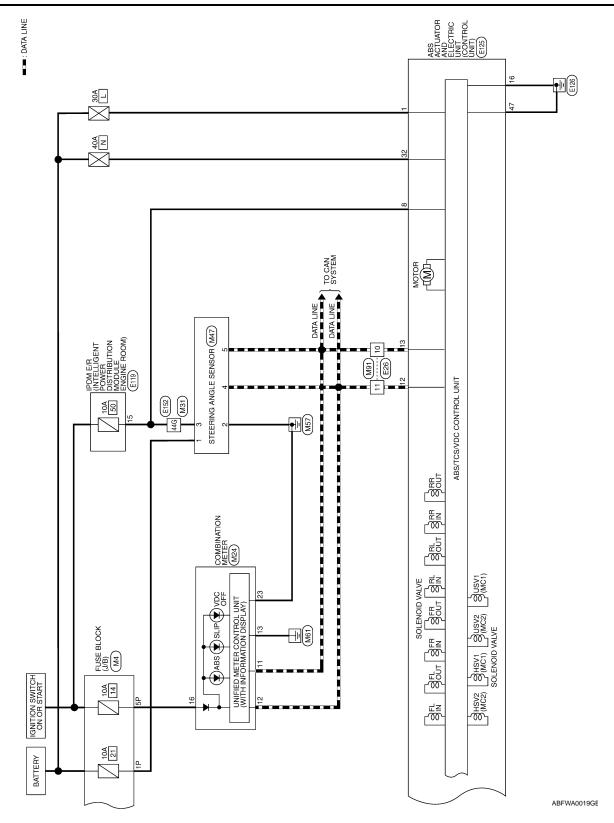
TERMINAL LAYOUT



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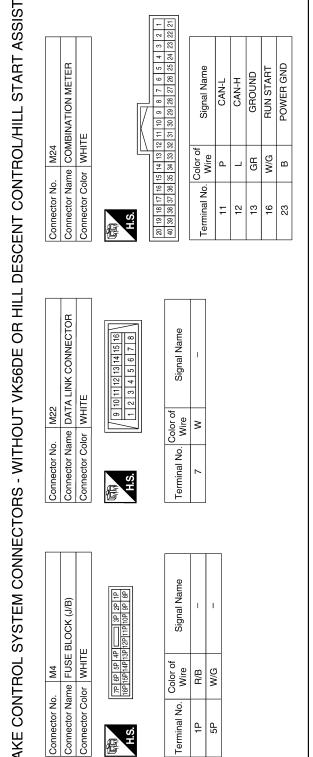


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BRAKE CONTROL SYSTEM CONNECTORS - WITHOUT VK56DE OR HILL DESCENT CONTROL/HILL START ASSIST



M47 STEERING ANGLE SENSOR	щ		7 2 3	Signal Name	BATT	GND	POWER	CAN-H	CAN-L			E
	or WHIT		1 4 4 9	Color of Wire	Ã	В	M/R	_	Д			
Connector No.	Connector Color WHITE		·S.H	Terminal No.	-	2	က	4	5			E
												BF
Signal Name	ı	ı										G
Sign												-
Color of Wire	W/B	>										I
Terminal No.	44G	48G					.					J
												K
			3G 2G 1G 8G 7G 6G	G 15G 14G 13G 12G 11G	66 356 346 336 326 316		6 556 546 536 526 516			756 746 736 726 716 806 796 786 776 766		L
Connector No. M31 Connector Name WIRE TO WIRE	/HITE		5G 4G 10G 9G	21G 20G 19G 18G 17G 16G 30G 29G 28G 27G 26G	416 406 396 386 376 366	50G 49G 48G 47G 46G	619 619 599 589 579 569	70G 69G 68G 67G 66G		75G 74G 73G 80G 79G 78		N
No. Mame W	Color			2162	4164		849		J			N
Connector No.	Connector Color WHITE		H.S.									C
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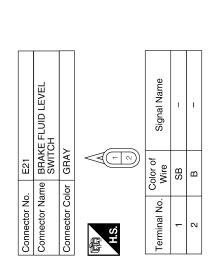
Connector No. M154
Connector Name VDC OFF SWITCH

Connector Color GRAY

Connector Color GRAY	WHEEL SENSOR LH Signal Name	Color of Wire	Terminal No.
Color of Wire	1	σ	-
H.S.	Signal Name	Color of Wire	Terminal No.
	WHEEL SENSOR LH	or GRAY	onnector Col
Connector Name FRONT WHEEL SENSOR LH		or GRAY	Sonnector Nar Sonnector Col
Connector No. E18 Connector Name FRONT WHEEL SENSOR LH		ne FRONT	ctor No.

2	Color of Signal Name Wire	1	- L	E34	WIRE TO WIRE	VHITE	8 8 4 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	of Signal Name
H.S.	Terminal No. Wi	-	2	Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE	所 H.S.	Terminal No. Wire
2 1	Signal Name	ı	ı		TO WIRE		3	Signal Name
6 5 4 3	Color of Wire	GR	В	. E26	me WIRE	lor WHITE	8 10 8 11 11 11 11 11 11 11 11 11 11 11 11 1	Color of Wire
原 H.S.	Terminal No.	-	2	Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE	是 H.S.	Terminal No.

	IE TO WIRE	ПЕ	4 3 2 1 13 12 11 10 9 8		Signal Name	I	_	_
	me WIF	lor WH	7 6 5 4 C		Color of Wire	GR	Д	٦
Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE		i.	Terminal No. Wire	3	10	11



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[TYPE 1] < ECU DIAGNOSIS >

:	e FRON	GRA		Color of Wire	В	Μ
	Connector Name	Connector Color	向 H.S.	Terminal No.	1	2

E41	WIRE TO WIRE	BLACK	190 190
Connector No.	Connector Name	Connector Color E	H.S. H.S. Collide Coll

Signal Name	I	1	I	1
Color of Wire	Ь	Γ	۸	LG
Terminal No.	15C	16C	17C	18C

Connector No.). E38	
Connector Name		STOP LAMP SWITCH
Connector Color	olor WHITE	ш
H.S.	<u>8</u> L	
Terminal No.	Color of Wire	Signal Name
-	B/B	I
c	>	ı

6	Connector Name POWER DISTRIBUTION MODULE ENGINE ROOM)	TE	14 13 12 11 10	Signal Name	ABS IGN SUPPLY
E119	MO MO	r WH	8 7 6 1 17 16 15	Color of Wire	W/R
Connector No.	Connector Nam	Connector Color WHITE	H.S.	Terminal No.	15
U		U			

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Signal Name	CLUS GND	1	ı	KL30 V	FR-RH SIG	FR-RH PWR	1	RR-LH PWR	RR-LH SIG	1	STOP LAMP SW	ı	1	RR-RH SIG	RR-RH PWR	1	FR-LH PWR	FR-LH SIG	GND P
Color of Wire	BR	1	ı	>	8	В	-	٦	۵	1	SB	ı	1	>	LG	-	g	щ	В
Terminal No.	29	30	31	32	33	34	32	36	37	38	68	40	41	42	43	44	45	46	47

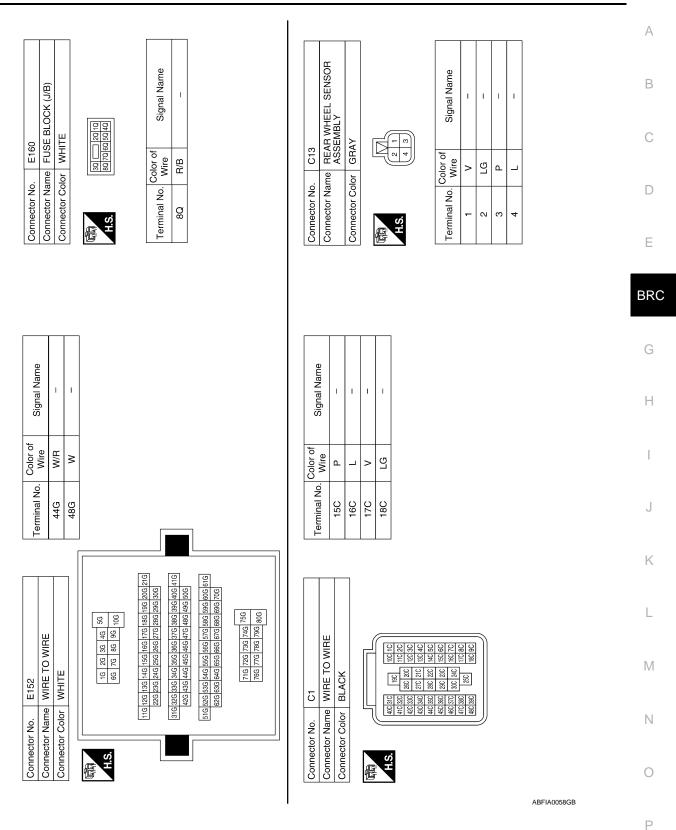
Terminal No.	Color of	Signal Name
-	2 ~	KI 30-P
2	1	
3	ı	1
4	1	ı
5	ı	ı
9	GR	VDC OFF SW
7	1	ı
8	W/R	IGN
6	ı	ı
10	SB	DIAG K
11	1	ı
12	_	CAN-H
13	Ь	CAN-L
14	_	_
15	-	_
16	В	GND V
17	_	_
18	0	CAN2-H
19	W	CAN2-L
20	_	_
21	1	_
22	>	CLUS SP
23	1	1
24	_	_
25	ı	I
26	ı	ı
27	1	_
28	GR	BRAKE LEVEL SW

Connector No.	E125
Connector Name	Connector Name ELECTRIC UNIT (CONTROL UNIT) (WITH VQ40DE)
Connector Color BLACK	BLACK



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< ECU DIAGNOSIS > [TYPE 1]



BRC-103

B73	Connector Name YAW RATE/SIDE/DECEL G SENSOR	BLACK
Connector No.	Connector Name	Connector Color BLACK







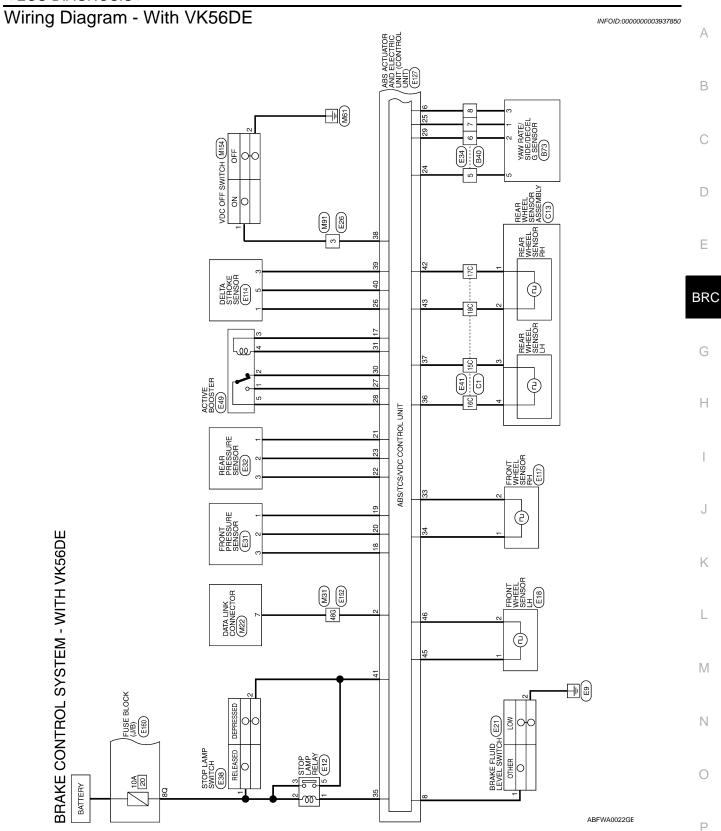
B40	e WIRE TO WIRE	WHITE	
nector No.	nector Name	nector Color	

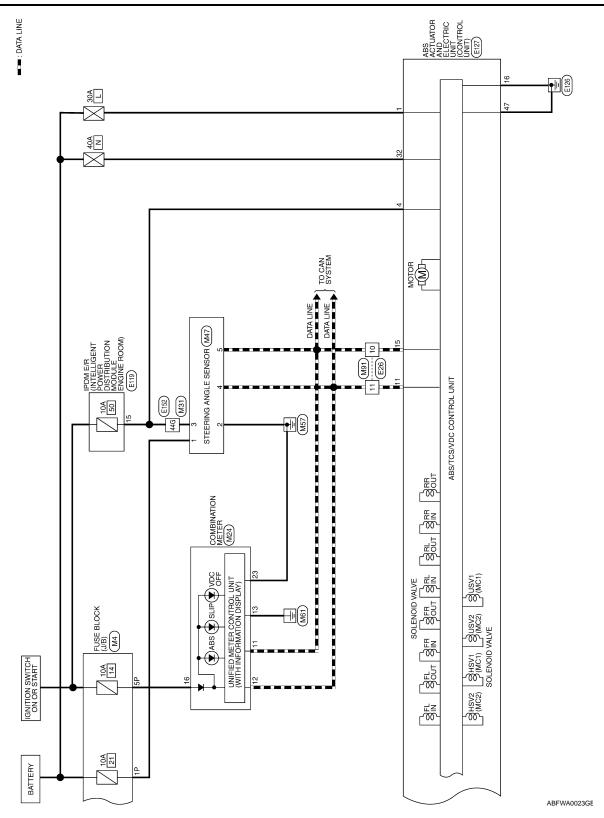




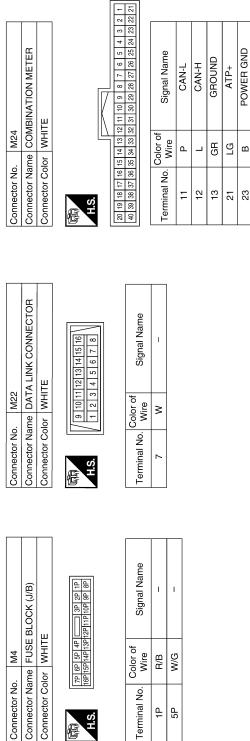
Signal Name	I	1	ı	I
Color of Wire	BR	0	8	\
Terminal No.	5	9	7	8

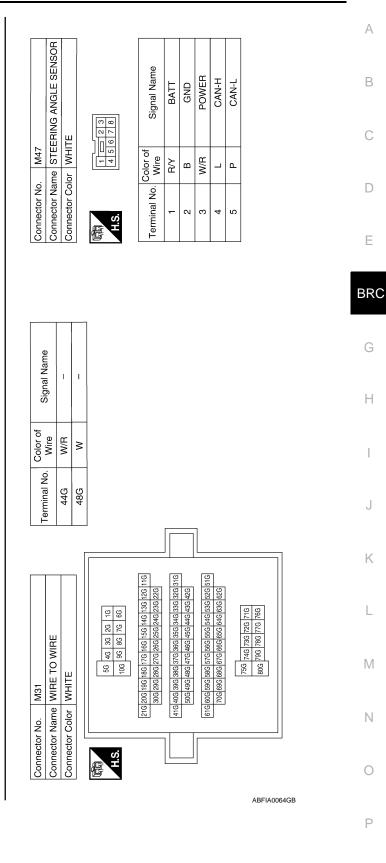
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< ECU DIAGNOSIS >

Connector No.). E12	
Connector Name		STOP LAMP RELAY
Connector Color	olor BLUE	JE
唇	Ш,	8
H.S.		
Terminal No.	Color of Wire	Signal Name
-	>	1
2	R/B	ı
3	R/B	ı
5	ŋ	1

Connector No.	. M154	4
Connector Na	me VDC	Connector Name VDC OFF SWITCH
Connector Color GRAY	lor GR/	λ'
H.S.	9 2	4 3 2 1
Terminal No.	Color of Wire	Signal Name
-	GR	-
2	В	-

Connector No.). M91	
Connector Name		WIRE TO WIRE
Connector Color	olor WHITE	믵
H.S.	7 6 5 16 15 14	7 6 5 4
Terminal No.	Color of Wire	Signal Name
3	GR	1
10	Ь	I
11	٦	ı

N TOTOGRAD	300	
COIIIIECIOI INO.		
Connector Name	ıme WII	WIRE TO WIRE
Connector Color WHITE	lor WF	ITE
管	1 2 3 8 9 10	3
ę.		
Terminal No.	Color of Wire	Signal Name
3	GR	1
10	Д	-
11	_	1

Connector No.	, E21	
Connector Name		BRAKE FLUID LEVEL SWITCH
Connector Color	lor GRAY	,
H.S.	(n)	
Terminal No.	Color of Wire	Signal Name
-	SB	_
2	В	_

Connector No.	. E18	
Connector Name		FRONT WHEEL SENSOR LH
Connector Color	lor GRAY	
H.S.		[4]
Terminal No.	Color of Wire	Signal Name
1	9	_
2	Œ	ı

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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 1]

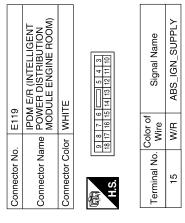
			А
) WIRE	Signal Name	Signal Name	В
E34 WHITE WHITE 8 7 8 7 6	Color of Wire BR W W	Color of Line LG V	С
Connector No. E34 Connector Name WIRE TO WIRE Connector Color WHITE H.S. 4 3 2 1 8 7 6 5	Terminal No. Co. 7	15C 16C 18C 18C	D
		<u> </u>	E
			BRO
Connector No. E32 Connector Name REAR PRESSURE SENSOR Connector Color BLACK H.S.	Signal Name GND SIG PWR		G
EAR PRESS ACK			Н
Connector No. E32 Connector Name REAR F Connector Color BLACK H.S.	Vo. Color of Wire Y Y Y L	Connector No. E41 Connector Name WIRE T Connector Color BLACK H.S. E010	I
Connector No. Connector Col	Terminal No.	Connector No. Connector Colo	J
			К
Connector No. E31 Connector Name FRONT PRESSURE SENSOR Connector Color BLACK H.S.	Signal Name GND SIG PWR	STOP LAMP SWITCH WHITE Strop Lamp Switch Signal Name Ire R - - - - - - - - - - - -	L
E31 FRONT PI BLACK	Color of Wire Wire LG		M
Connector No. E31 Connector Name FRONT Connector Color BLACK H.S.	Terminal No. W	ctor No.	N
Conne Conne Conne H.S.	Termi		0
	•	AWFIA0129GB	

	Connector Name FRONT WHEEL SENSOR RH			Signal Name	ı	ı
E117	ne FRON	or GRAY		Color of Wire	В	^
Connector No.	Connector Na	Connector Color	雨 H.S.	Terminal No.	-	٥

	FRONT WHEEL SENSOF			Signal Name	-	-
E117		r GRA		Color of Wire	В	Ν
Connector No.	Connector Name	Connector Color GRAY	用.S.	Terminal No.	1	2

Connector No.). E114	4
Connector Na	ıme DEL	Connector Name DELTA STROKE SENSOR
Connector Color BLACK	olor BLA	CK
南 H.S.		3 2 1
Terminal No.	Color of Wire	Signal Name
1	9	PWR_SUP
3	БЛ	GND
2	0	SIG

Connector No.	. E49	
Connector Name		ACTIVE BOOSTER
Connector Color BLACK	lor BLA	CK
H.S.		3 2 1
Terminal No.	Color of Wire	Signal Name
-	_	ı
2	ГС	_
3	Μ	_
4	0	_
2	Υ	Ι



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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 1]

Signal Name	CAN2-H	BPFS NC	BST PWM	VALVE ECU SUPPLY	FR RH SIG	FR RH PWR	BRK OUT (OFF)	RR LH PWR	RR LH SIG	VDC OFF SW	DELS GND	DELS SIGN	STOP LAMP SW	RR RH SIG	RR RH PWR	ı	FR LH PWR	FR LH SIG	MOTOR GND
Color of Wire	0	LG	0	>	8	В	>	_	۵	GR	LG	0	SB	>	LG	I	В	В	В
Terminal No.	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

	Color of	Signal Maga
l ermınal No.	Wire	olgilal Ivalile
-	Œ	MOTOR SUPPLY
2	SB	DIAG K
3	ŀ	I
4	W/R	NSI
5	ı	ı
9	>	CLUS SP
7	1	ı
8	GR	FLUID LEVEL SW
6	ı	I
10	ı	ı
7	٦	CAN-H
12	ı	I
13	ı	ı
14	1	I
15	Ь	CAN-L
16	В	VALVE ECU GND
17	Μ	BST PWR
18	0	DRIV1 SENSEP
19	Μ	DRIV1 GND
20	LG	DRIV1 SIG
21	>	DRIV2 GND
22	٦	DRIV2 SP
23	Ь	DRIV2 SIG
24	BR	CLUS GND
25	>	CAN2-L
26	ß	DELS SENSEP
27	_	BPFS NO
28	>	BPFS SIG

E127	Connector Name ELECTRIC UNIT (CONTROL UNIT) (WITH VK56DE)	3LACK		
Connector No.	Connector Name	Connector Color BLACK	明.S.	



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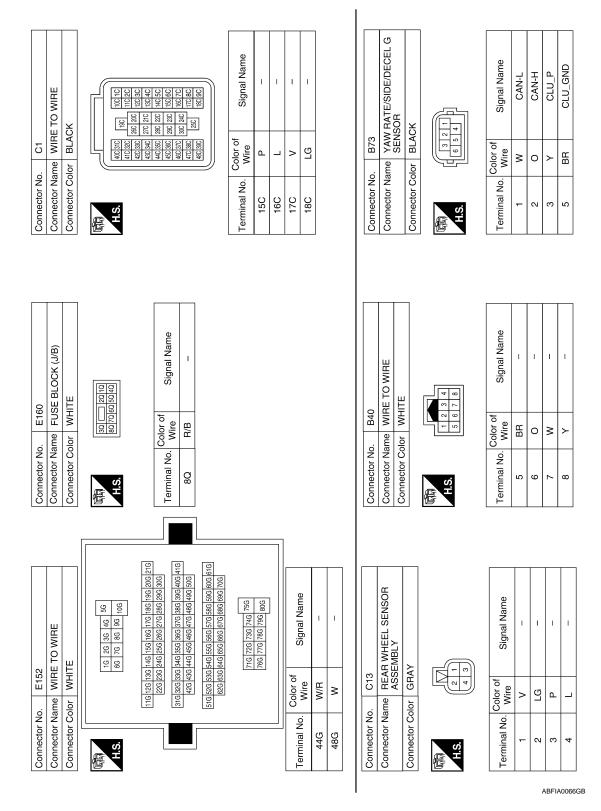
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< ECU DIAGNOSIS >



Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS/TCS/VDC system.

ABS/EBD SYSTEM

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 1]

In case of an electrical malfunction with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on.

The system will revert to one of the following conditions of the Fail-Safe function.

- 1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS/TCS/VDC system.
- For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS/TCS/VDC or EBD system.

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VDC/TCS SYSTEM

In case of TCS/VDC system malfunction, the VDC OFF indicator lamp and SLIP indicator lamp are turned on and the condition of the vehicle is the same as the condition of vehicles without TCS/VDC system. In case of an electrical malfunction with the TCS/VDC system, the ABS control continues to operate normally without TCS/VDC control.

DTC No. Index

BR	Reference	Items (CONSULT screen terms)	DTC
		RR RH SENSOR-1	C1101
	DDC 20 IDinti-ul	RR LH SENSOR-1	C1102
G	BRC-32, "Description"	FR RH SENSOR-1	C1103
		FR LH SENSOR-1	C1104
— Н		RR RH SENSOR-2	C1105
11	DDC 25 IDinti-ul	RR LH SENSOR-2	C1106
	BRC-35, "Description"	FR RH SENSOR-2	C1107
- 1		FR LH SENSOR-2	C1108
	BRC-38, "Description"	BATTERY VOLTAGE [ABNORMAL]	C1109
	BRC-41, "DTC Logic"	CONTROLLER FAILURE	C1110
J	BRC-42, "Description"	PUMP MOTOR	C1111
	BRC-45, "Description"	G-SENSOR	C1113
K	BRC-48, "Description"	ABS SENSOR [ABNORMAL SIGNAL]	C1115
	BRC-51, "Description"	STOP LAMP SW	C1116
	BRC-53, "Description"	FR LH IN ABS SOL	C1120
L	BRC-56, "Description"	FR LH OUT ABS SOL	C1121
	BRC-53, "Description"	FR RH IN ABS SOL	C1122
M	BRC-56, "Description"	FR RH OUT ABS SOL	C1123
	BRC-53, "Description"	RR LH IN ABS SOL	C1124
	BRC-56, "Description"	RR LH OUT ABS SOL	C1125
N	BRC-53, "Description"	RR RH IN ABS SOL	C1126
	BRC-56, "Description"	RR RH OUT ABS SOL	C1127
0		ENGINE SIGNAL 1	C1130
		ENGINE SIGNAL 2	C1131
	BRC-59, "Description"	ENGINE SIGNAL 3	C1132
Р		ENGINE SIGNAL 4	C1133
		ENGINE SIGNAL 6	C1136
	BRC-61, "Description"	ACTUATOR RLY	C1140
	BRC-63, "Description"	PRESS SEN CIRCUIT	C1142
	DDC CC Dinti	ST ANG SEN CIRCUIT	C1143
	BRC-66, "Description"	ST ANG SEN SIGNAL	C1144

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 1]

DTC	Itama (CONCLILT agreen terms)	Deference
DTC	Items (CONSULT screen terms)	Reference
C1145	YAW RATE SENSOR	BRC-45, "Description"
C1146	SIDE G-SEN CIRCUIT	DIXO-40, Description
C1155	BR FLUID LEVEL LOW	BRC-69, "Description"
C1156	ST ANG SEN COM CIR	BRC-72, "Description"
C1160	DECEL G SEN SET	BRC-73, "Description"
C1163	ST ANGL SEN SAFE	BRC-74, "Description"
C1164	CV1	
C1165	CV2	DDC 75 "Description"
C1166	SV1	BRC-75, "Description"
C1167	SV2	
C1170	VARIANT CODING	BRC-41, "DTC Logic"
C1178	ABS ACTIVE BOOSTER SV NG	BRC-78, "Description"
C1179	ABS DELTA S SEN NG	BRC-81, "Description"
C1181	ABS ACTIVE BOOSTER RESPONSE NG	
C1184	ABS BRAKE RELEASE SW NG	BRC-78, "Description"
C1189	ABS BRAKE BOOSTER DEFECT	
U1000	CAN COMM CIRCUIT	BRC-83, "Description"

APPLICATION NOTICE

< SYMPTOM DIAGNOSIS > [TYPE 1]

SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

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VDC/TCS/ABS

Symptom Table

If ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
	Brake force distribution	
Excessive ABS function operation frequency	Looseness of front and rear axle	BRC-117, "Diagno- sis Procedure"
4400)	Wheel sensor and rotor system	<u> </u>
Unexpected pedal reaction	Brake pedal stroke	BRC-118, "Diagno-
Onexpected pedal reaction	Make sure the braking force is sufficient when the ABS is not operating.	sis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-119, "Diagno- sis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-120, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound	Brake pedal	BRC-121, "Diag-
occurs (Note 2)	ABS actuator and electric unit (control unit)	nosis Procedure"
	ABS actuator and electric unit (control unit)	
Vehicle jerks during VDC/TCS/ABS con- trol	TCM	BRC-122, "Diag- nosis Procedure"
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.
- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

[TYPE 1] < SYMPTOM DIAGNOSIS > **EXCESSIVE ABS FUNCTION OPERATION FREQUENCY** Α Diagnosis Procedure INFOID:0000000003937855 1.CHECK START В Check front and rear brake force distribution using a brake tester. Is the inspection result normal? YES >> GO TO 2 NO >> Check brake system. 2.CHECK FRONT AND REAR AXLE D Make sure that there is no excessive play in the front and rear axles. Refer to front: FAX-5, "On-Vehicle Inspection and Service", Rear: RAX-5, "On-Vehicle Inspection and Service". Is the inspection result normal? Е YES >> GO TO 3 NO >> Repair or replace malfunctioning components. 3.CHECK WHEEL SENSOR AND SENSOR ROTOR **BRC** Check the following. Wheel sensor installation for damage. Sensor rotor installation for damage. Wheel sensor connector connection. · Wheel sensor harness inspection. Is the inspection result normal? Н YES >> GO TO 4 NO >> • Replace wheel sensor or sensor rotor. Refer to BRC-129, "Removal and Installation". Repair harness. 4. CHECK ABS WARNING LAMP DISPLAY Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated? YES >> Perform self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)". NO >> Normal K L M Ν Р

INFOID:0000000003937856

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to <u>BR-17</u>, "Inspection and Adjustment - Standard Pedal" or <u>BR-18</u>, "Inspection and Adjustment - Adjustable Pedal".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to BR-20, "Bleeding Brake System".
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-17</u>, "<u>Inspection and Adjustment Standard Pedal</u>" or <u>BR-18</u>. "<u>Inspection and Adjustment Adjustable Pedal</u>" (brake pedal), <u>BR-47</u>, "<u>Disassembly and Assembly</u>" (master cylinder), <u>BR-10</u>, "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is normal in this condition. Connect connector after inspection.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000003937857

CAUTION:

The stopping distance on slippery road surfaces might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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ABS FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS > [TYPE 1]

ABS FUNCTION DOES NOT OPERATE

Diagnosis Procedure

INFOID:0000000003937858

CAUTION:

ABS does not operate when speed is 10 km/h (6 MPH) or lower.

1. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal?

YES >> Normal

NO >> Perform self-diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)".

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

[TYPE 1] < SYMPTOM DIAGNOSIS > PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS Α Diagnosis Procedure INFOID:0000000003937859 **CAUTION:** В Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal. When shifting gears When driving on slippery road During cornering at high speed When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more] When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher] D 1.SYMPTOM CHECK 1 Check that there are pedal vibrations when the engine is started. Е Do vibrations occur? YES >> GO TO 2 NO >> Inspect the brake pedal. BRC 2.SYMPTOM CHECK 2 Check that there are ABS operation noises when the engine is started. Do the operation noises occur? YES >> GO TO 3 NO >> Perform self -diagnosis. Refer to BRC-26, "CONSULT-III Function (ABS)". Н 3.SYMPTOM CHECK 3 Check symptoms when electrical component (headlamps, etc.) switches are operated. Do symptoms occur? YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away. NO >> Normal J K L M Ν Р

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

Diagnosis Procedure

INFOID:0000000003937860

1.SYMPTOM CHECK

Check if the vehicle jerks during VDC/TCS/ABS control.

Is the inspection result normal?

YES >> Normal. NO >> GO TO 2

2. CHECK SELF-DIAGNOSIS RESULTS

Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to <u>BRC-26, "CONSULT-III Function (ABS)"</u>.

Are self-diagnosis results indicated?

YES >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis.

NO >> GO TO 3

3. CHECK CONNECTOR

- Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc.
- Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis.

Are self-diagnosis results indicated?

YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace.

NO >> GO TO 4

4. CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS

Perform ECM and TCM self-diagnosis.

Are self-diagnosis results indicated?

YES

- >> Check the corresponding items.
 - ECM: Refer to <u>EC-73</u>, "CONSULT-III Function (ENGINE)" (VQ40DE) or <u>EC-546</u>, "CONSULT-III Function (ENGINE)" (VK56DE).
 - TCM: Refer to TM-36, "CONSULT-III Function (TRANSMISSION)".
- NO >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-131</u>, "Removal and Installation".

NORMAL OPERATING CONDITION

[TYPE 1] < SYMPTOM DIAGNOSIS >

NORMAL OPERATING CONDITION

Description INFOID:0000000003937861

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.	This is a normal condition due to the VDC, TCS or ABS activation.	
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.		
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.		
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel. This is normal, be		
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	n In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. At that time, erase the self-	
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).		
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).		
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)	
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.	

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< PRECAUTION > [TYPE 1]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

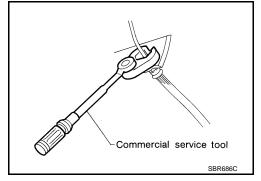
- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution for Brake System

INFOID:0000000003937863

CAUTION:

- Refer to MA-12, "Fluids and Lubricants" for recommended brake fluid.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- · Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.



Refer to BR-38, "Brake Burnishing" (front disc brake) or BR-43, "Brake Burnishing" (rear disc brake).

WARNING:

• Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precaution for Brake Control

INFOID:0000000003937864

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

[TYPE 1] < PRECAUTION >

 When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.

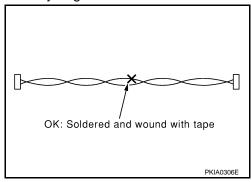
- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.
- If the following components are replaced with non-genuine components or modified, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (shock absorbers, struts, springs, bushings, etc.), tires, wheels (exclude specified size), components related to brake system (pads, rotors, calipers, etc.), components related to engine (muffler, ECM, etc.), components related to body reinforcement (roll bar, tower bar, etc.).
- Driving with broken or excessively worn suspension components, tires or brake system components may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. This is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. with VDC turned off may cause the yaw rate/side/decel G sensor to indicate a problem. This is not a problem if normal operation can be resumed after restarting the engine.
- If battery is removed or steering angle sensor is disconnected, power to steering angle sensor is lost and the screen goes into steering angle sensor safe mode.
- When screen goes into steering angle sensor safe mode, perform "Adjustment of Steering Angle Sensor Neutral Position" with CONSUT-III and check that VDC OFF indicator turns off. Additionally, perform selfdiagnosis, check that only "Steering Angle Sensor Safe Mode" is shown for self-diagnostic result, and then delete the memory. (If the self-diagnostic result shows an indication other than "Steering Angle Sensor Safe Mode", repair the relevant part and restart self-diagnosis.) The steering angle sensor is released and returns to normal condition by performing the above operation.
- When checking, if only "Steering Angle Sensor Safe Mode" is shown in the self-diagnostic result and VDC OFF indicator is off, delete history of malfunction. This happens when battery power supply is lost and the screen goes into Steering Angle Sensor Safe Mode, and then screen returns to normal mode automatically by driving the vehicle in a straight forward direction [for approximately 30 seconds at 20 km/h (12 MPH) or more] after power is supplied again.

NOTE:

VDC OFF indicator lamp is on when VDC OFF switch is on.

Precaution for CAN System

- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape. Make sure that fraying of twisted wire is within 110 mm (4.33 in).



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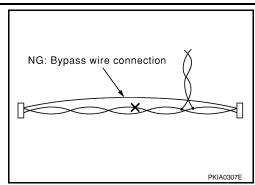
INFOID:0000000003937865

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PRECAUTIONS

< PRECAUTION > [TYPE 1]

 Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



< PREPARATION > [TYPE 1]

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INFOID:0000000003937866

PREPARATION

PREPARATION

Special Service Tool

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
KV991J0080 (J-45741) ABS active wheel sensor tester	J-45741-BOX	Checking operation of ABS active wheel sensors
ST30031000 (—)	₩FIA0101E	Removing sensor rotor
Bearing puller		
ST30720000	ZZA0700D	Installing rear sensor rotor
(J-25405) Drift	a b	a: 77 mm (0.03 in) diameter b: 55 mm (2.17 in) diameter
ST27863000	ZZA0701D	Installing rear sensor rotor
(—) Drift	a b b	a: 75 mm (2.95 in) diameter b: 62 mm (2.44 in) diameter
KV40104710	ZZA0832D	Installing roar consor rotor
(—) Drift	a — a — b —	Installing rear sensor rotor a: 76 mm (2.99 in) diameter b: 68.5 mm (2.697 in) diameter
	ZZA0832D	

< PREPARATION > [TYPE 1]

Commercial Service Tool

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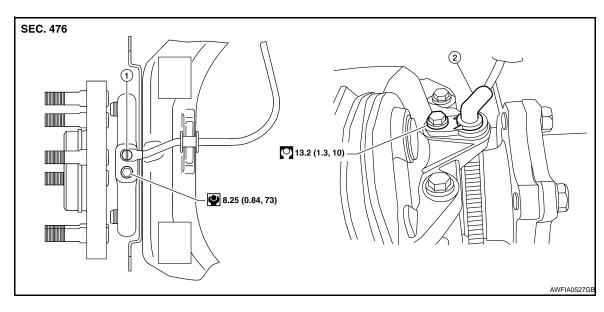
Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
	S-NT360	
Power tool		Removing nuts, bolts and screws
	PIIB1407E	

INFOID:0000000003937868

REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation



1. Front wheel sensor LH

Rear wheel sensor RH

REMOVAL

- 1. Remove the wheel and tire. Refer to WT-48, "Rotation".
- Remove the wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to BR-44, "Removal and Installation of Brake Caliper and Disc Rotor".
 - When removing the rear wheel sensor, first remove the spare tire.
- 3. Pull the wheel sensor out, being careful to turn it as little as possible.

CAUTION:

- Be careful not to damage wheel sensor edge or the sensor rotor teeth.
- Do not pull on the wheel sensor harness.
- 4. Disconnect then wheel sensor harness connector, then remove the wheel sensor harness from the mounts and remove the wheel sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Inspect wheel sensor O-ring, replace wheel sensor if damaged.
- Before installing the wheel sensor, make sure no foreign materials (such as iron fragments) are adhered to the pick-up part of the wheel sensor, to the inside of the wheel sensor hole or on the sensor rotor in the wheel hub assembly.
- Clean wheel sensor hole and mating surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle or wheel hub assembly.

Apply a coat of suitable grease to the wheel sensor O-ring and mating hole.

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SENSOR ROTOR

Removal and Installation

INFOID:0000000003937869

FRONT WHEEL SENSOR ROTOR

The front wheel sensor rotors are built into the front wheel hub and bearing assemblies and are not removable. If damaged, replace the front wheel hub and bearing assembly. Refer to <u>FAX-9</u>, "Removal and Installation".

REAR WHEEL SENSOR ROTOR

Removal

Remove the side flange from the final drive assembly. Refer to <u>DLN-407</u>, "<u>Removal and Installation</u>" (R200) or <u>DLN-444</u>, "<u>Removal and Installation</u>" (R230).
 CAUTION:

Discard side oil seal.

2. Using suitable tool with Tool (puller), remove the sensor rotor from the side flange.

Tool number : ST30031000 (—)

Installation

 Install the new sensor rotor on the side flange using Tools and a suitable press as shown. Make sure the sensor rotor is fully seated on the side flange.

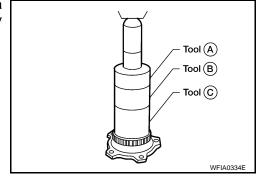
Tool numbers A: ST30720000 (J-25405)

B: ST27863000 (—)

C: KV40104710 (—)

CAUTION:

Do not reuse the old sensor rotor.



Install the side flange on the final drive assembly. Refer to <u>DLN-407</u>, "Removal and Installation" (R200) or <u>DLN-444</u>, "Removal and Installation" (R230).

CAUTION:

Do not reuse the side oil seal. The side oil seal must be replaced every time the side flange is removed from the final drive assembly.

INFOID:0000000003937870

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

VK56DE

SEC. 476

1 2 (2.1, 15)

8 7.0 (0.71, 62)

Nrm (kg-m, in-lb)

Nrm (kg-m, ft-lb)

Nrm (kg-m, ft-lb)

- To rear left disc brake
 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 4. To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 7. ABS actuator and electric unit (control unit)
- To rear right disc brake
 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 5. From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- 8. Harness connector

- 3. To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 6. From master cylinder primary side 18.2 N·m (1.9 kg-m, 13 ft-lb)

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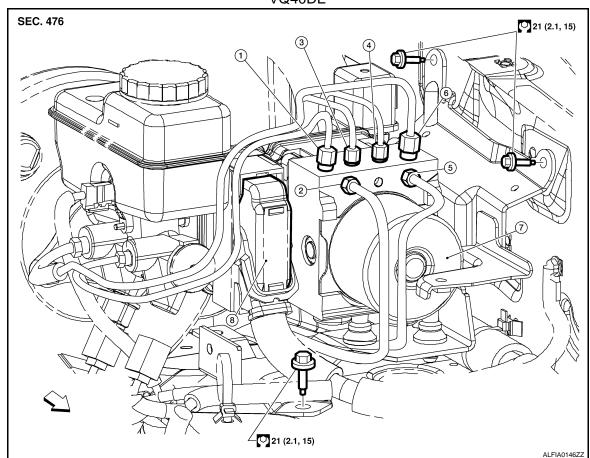
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VQ40DE



- From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- ABS actuator and electric unit (control unit)
- To rear right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- Harness connector
- To rear left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- From master cylinder primary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- <□ Front

REMOVAL

- Disconnect the battery negative terminal.
- 2. Drain the brake fluid. Refer to BR-20, "Drain and Refill".
- 3. Disconnect the actuator harness from the ABS actuator and electric unit (control unit).

CAUTION:

- To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
- Be careful not to splash brake fluid on painted areas.
- 4. Disconnect the brake tubes.
- Remove the three bolts and remove the ABS actuator and electric unit (control unit) and bracket. 5.
- Remove the bracket from the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

 If the ABS actuator and electric unit (control unit) is replaced, the neutral position of the steering angle sensor position must be reset. Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

CAUTION:

- To tighten the brake tube flare nuts use a suitable tool (flare nut wrench).
- Always tighten the brake tube flare nuts to specification when installing.
- · Never reuse the drained brake fluid.

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[TYPE 1]

• After installation of the ABS actuator and electric unit (control unit), refill the brake system with new brake fluid. Then bleed the air from the brake system. Refer to BR-20, "Bleeding Brake System".

 If the ABS actuator and electronic unit (control unit) is replaced, the neutral position of the steering angle sensor must be reset. Refer to <u>BRC-141</u>, "<u>ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION</u>: Special Repair Requirement".

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STEERING ANGLE SENSOR

Removal and Installation

INFOID:0000000003937871

REMOVAL

- 1. Remove the spiral cable. Refer to SR-7, "Removal and Installation".
- 2. Remove the screws and remove the steering angle sensor from the spiral cable.

INSTALLATION

Installation is in the reverse order of removal.

 Reset the neutral position of the steering angle sensor. Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

CAUTION

Any time the steering angle sensor is removed and installed or replaced, you must reset the neutral position of the steering angle sensor. Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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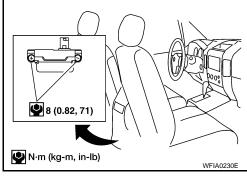
G SENSOR

Removal and Installation

REMOVAL

- 1. Remove the center console. Refer to IP-16, "Exploded View".
- 2. Remove the yaw rate/side/decel G sensor nuts as shown. **CAUTION:**
 - Do not use power tools to remove or install the yaw rate/ side/decel G sensor.
 - Do not drop or strike the yaw rate/side/decel G sensor.

The location of the yaw rate/side/decel G sensor is the same for all models.



3. Disconnect the yaw rate/side/decel G sensor connector and remove the yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

• After installing the yaw rate/side/decel G sensor, it is necessary to calibrate the yaw rate/side/decel G sensor. Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement".

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APPLICATION NOTICE

< BASIC INSPECTION > [TYPE 2]

BASIC INSPECTION

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

INFOID:0000000003937873

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION > [TYPE 2]

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

PRECAUTIONS FOR DIAGNOSIS

If steering angle sensor, steering system parts, suspension system parts, ABS actuator and electric unit (control unit) or tires have been replaced, or if wheel alignment has been adjusted, be sure to adjust neutral position of steering angle sensor before driving. Refer to BRC-141. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

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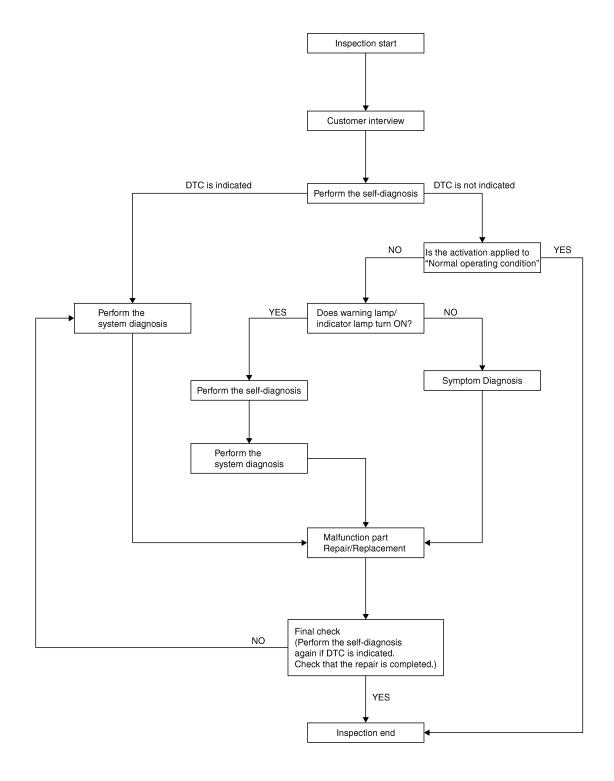
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OVERALL SEQUENCE



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DETAILED FLOW

1. COLLECT THE INFORMATION FROM THE CUSTOMER

Get the detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurred) using the diagnosis worksheet. Refer to BRC-140, "Diagnostic Work Sheet".

DIAGNOSIS AND REPAIR WORKFLOW

DIAGNOSIS AND REPAIR WORKFLOW
< BASIC INSPECTION > [TYPE 2]
>> GO TO 2
2.PERFORM THE SELF-DIAGNOSIS
Check the DTC display with the self-diagnosis function. Refer to BRC-153, "CONSULT-III Function (ABS)".
Is there any DTC displayed?
YES >> GO TO 3 NO >> GO TO 4
NO >> GO TO 4 3. PERFORM THE SYSTEM DIAGNOSIS
Perform the diagnosis applicable to the displayed DTC. Refer to <u>BRC-218, "DTC No. Index"</u> .
>> GO TO 7
4. CHECK THE SYMPTOM THAT IS NOT CONSIDERED A SYSTEM MALFUNCTION
Check that the symptom is a normal operation that is not considered a system malfunction. Refer to <u>BRC-228</u> . "Description".
Is the symptom a normal operation?
YES >> Inspection End
NO >> GO TO 5
5. CHECK THE WARNING LAMP AND INDICATOR LAMP FOR ILLUMINATION
Check that the warning lamp and indicator lamp illuminate.
 ABS warning lamp: Refer to <u>BRC-202, "Description"</u>. Brake warning lamp: Refer to <u>BRC-203, "Description"</u>.
VDC OFF indicator lamp: Refer to <u>BRC-204, "Description"</u> .
• SLIP indicator lamp: Refer to <u>BRC-205</u> , " <u>Description"</u> .
Is ON/OFF timing normal?
YES >> GO TO 6 NO >> GO TO 2
6. PERFORM THE DIAGNOSIS BY SYMPTOM
Perform the diagnosis applicable to the symptom.
Tellerin the diagnosic applicable to the cymptonic
>> GO TO 7
7. REPAIR OR REPLACE THE MALFUNCTIONING PARTS
Repair or replace the specified malfunctioning parts.
>> GO TO 8
8. FINAL CHECK
Perform the self-diagnosis again, and check that the malfunction is repaired completely. After checking, erase
the self-diagnosis memory. Refer to <u>BRC-153, "CONSULT-III Function (ABS)"</u> .
Is no other DTC present and the repair completed?
YES >> Inspection End NO >> GO TO 3
110 >> GO 10 3

DIAGNOSIS AND REPAIR WORKFLOW

[TYPE 2]

Diagnostic Work Sheet

INFOID:0000000003937875

Customer name MR/MS	Model & Year		VIN	
Engine #	Trans.		Mileage	
Incident Date	Manuf. Date		In Service Dat	е
Symptoms	☐ Noise and vibration (from engine compartment) ☐ Noise and vibration (from axle)	☐ Warning / Indicator activate		☐ Firm pedal operation Large stroke pedal operation
	☐ TCS does not work (Rear wheels slip when accelerating)	☐ ABS does not work (Wheels lock when braking)		☐ Lack of sense of acceleration
Engine conditions	☐ When starting ☐ After starting			
Road conditions	□ Low friction road (□Snow □Gravel □Other) □ Bumps / potholes			
Driving conditions	□ Full-acceleration □ High speed cornering □ Vehicle speed: Greater than 10 km/h (6 MPH) □ Vehicle speed: 10 km/h (6 MPH) or less □ Vehicle is stopped			
Applying brake conditions	☐ Suddenly ☐ Gradually			
Other conditions	☐ Operation of electrical equipment☐ Shift change☐ Other descriptions			

SFIA3265E

[TYPE 2] < BASIC INSPECTION > INSPECTION AND ADJUSTMENT Α ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Description INFOID:0000000003937876 After replacing the ABS actuator and electric unit (control unit), perform the following procedures: Neutral position adjustment for the steering angle sensor Calibration of the decel G sensor ADDITIONAL SERVICE WHEN REPLACING CONTROL UNIT: Special Repair Requirement D INFOID:0000000003937877 ${f 1}$.PERFORM THE NEUTRAL POSITION ADJUSTMENT FOR THE STEERING ANGLE SENSOR Е Perform the neutral position adjustment for the steering angle sensor. >> Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION **BRC** Special Repair Requirement", GO TO 2 2.PERFORM CALIBRATION OF THE DECEL G SENSOR Perform calibration of the decel G sensor. >> Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement". ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Н ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description INFOID:0000000003937878 Refer to the table below to determine if adjustment of steering angle sensor neutral position is required. x: Required -: Not required Adjustment of steering angle sensor neutral position Situation Removing/Installing ABS actuator and electric unit (control unit) Replacing ABS actuator and electric unit (control unit) Removing/Installing steering angle sensor Replacing steering angle sensor Removing/Installing steering components Replacing steering components × Removing/Installing suspension components × Replacing suspension components \times Change tires to new ones Tire rotation Ν Adjusting wheel alignment ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement INFOID:0000000003937879 ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Р **CAUTION:** To adjust neutral position of steering angle sensor, make sure to use CONSULT-III (Adjustment cannot be done without CONSULT-III)

BRC-141

 ${f 1}$. ALIGN THE VEHICLE STATUS

Stop vehicle with front wheels in straight-ahead position.

< BASIC INSPECTION > [TYPE 2]

>> GO TO 2

2.perform the neutral position adjustment for the steering angle sensor

- 1. On the CONSULT-III screen, touch "WORK SUPPORT" and "ST ANG SEN ADJUSTMENT" in order.
- 2. Touch "START".

CAUTION:

Do not touch steering wheel while adjusting steering angle sensor.

3. After approximately 10 seconds, touch "END".

NOTE:

After approximately 60 seconds, it ends automatically.

4. Turn ignition switch OFF, then turn it ON again.

CAUTION:

Be sure to perform above operation.

>> GO TO 3

3. CHECK DATA MONITOR

- 1. Run vehicle with front wheels in straight-ahead position, then stop.
- Select "DATA MONITOR". Then make sure "STR ANGLE SIG" is within 0±2.5°.

Is the steering angle within the specified range?

YES >> GO TO 4

NO >> Perform the neutral position adjustment for the steering angle sensor again, GO TO 1

4. ERASE THE SELF-DIAGNOSIS MEMORY

Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM.

- ABS actuator and electric unit (control unit): Refer to BRC-153, "CONSULT-III Function (ABS)".
- ECM: Refer to EC-73, "CONSULT-III Function (ENGINE)".

Are the memories erased?

YES >> Inspection End

NO >> Check the items indicated by the self-diagnosis.

CALIBRATION OF DECEL G SENSOR

CALIBRATION OF DECEL G SENSOR: Description

INFOID:0000000003937880

Refer to the table below to determine if calibration of the decel G sensor is required.

x: Required -: Not required

	· · · · · · · · · · · · · · · · · · ·
Situation	Calibration of decel G sensor
Removing/Installing ABS actuator and electric unit (control unit)	_
Replacing ABS actuator and electric unit (control unit)	×
Removing/Installing steering angle sensor	×
Replacing steering angle sensor	×
Removing/Installing steering components	×
Replacing steering components	×
Removing/Installing suspension components	×
Replacing suspension components	×
Change tires to new ones	_
Tire rotation	_
Adjusting wheel alignment	×

CALIBRATION OF DECEL G SENSOR: Special Repair Requirement

INFOID:0000000003937881

CALIBRATION OF DECEL G SENSOR

CAUTION:

To calibrate the decel G sensor, make sure to use CONSULT-III (Calibration cannot be done without CONSULT-III)

INSPECTION AND ADJUSTMENT

INSPECTION AND ADJUSTMENT	[TYPE 2]
< BASIC INSPECTION > 1. ALIGN THE VEHICLE STATUS	[111 = 2]
Stop vehicle with front wheels in straight-ahead position.	
otop verilde with from wheels in straight-ahead position.	
>> GO TO 2	
2.PERFORM CALIBRATION OF DECEL G SENSOR	
 On the CONSULT-III screen, touch "WORK SUPPORT" and "DECEL G SEN CALIBRATIC Touch "START". 	N" in order.
3. After approximately 10 seconds, touch "END".	
NOTE: After approximately 60 seconds, it ends automatically.	
 Turn ignition switch OFF, then turn it ON again. CAUTION: 	
Be sure to perform above operation.	
>> GO TO 3	
3.CHECK DATA MONITOR	
Run vehicle with front wheels in straight-ahead position, then stop.	
2. Select "DATA MONITOR". Then make sure "DECEL G SEN" is within ±0.08G.	
Is the inspection result normal? YES >> GO TO 4	
NO >> Perform calibration of decel G sensor again, GO TO 1	
4.erase the self-diagnosis memory	
Erase the self-diagnosis memory of the ABS actuator and electric unit (control unit) and ECM. • ABS actuator and electric unit (control unit): Refer to BRC-153 , "CONSULT-III Function (ABS)	
• ECM: Refer to EC-73, "CONSULT-III Function (ENGINE)".	⊥ .
Are the memories erased?	
YES >> Inspection End NO >> Check the items indicated by the self-diagnosis.	
,	

APPLICATION NOTICE

< FUNCTION DIAGNOSIS >

[TYPE 2]

FUNCTION DIAGNOSIS

APPLICATION NOTICE

Application Notice

INFOID:0000000003937882

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

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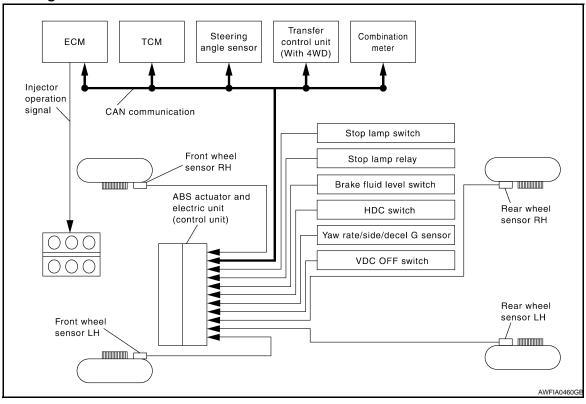
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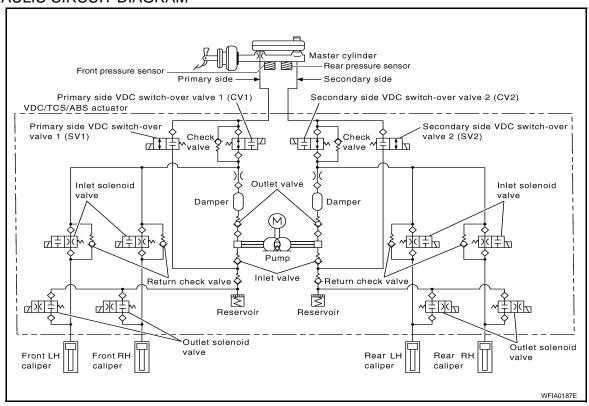
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 VDC

System Diagram



HYDRAULIC CIRCUIT DIAGRAM



System Description

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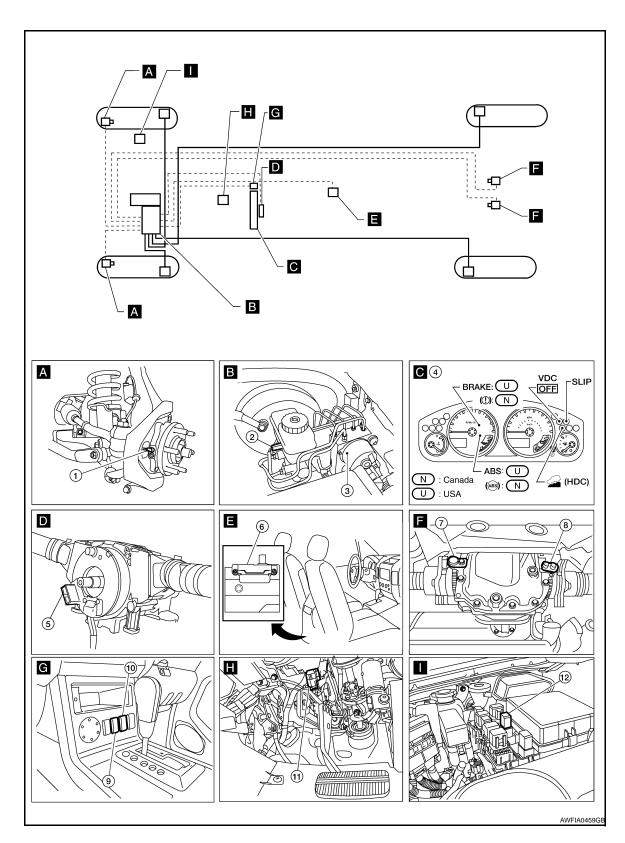
 Vehicle Dynamics Control system detects driver's steering operation amount and brake pedal travel from steering angle sensor and pressure sensors. Using information from yaw rate/side/decel G sensor and wheel sensor, VDC judges driving condition (conditions of under steer and over steer) to improve vehicle driving stability by controlling brake application to 4 wheels and engine output.

• During VDC operation, it informs driver of system operation by flashing SLIP indicator lamp.

• Electrical system diagnosis by CONSULT-III is available.

Component Parts Location

INFOID:0000000003937885



- Front wheel sensor LH E18
 Front wheel sensor RH E117
- 4. Combination meter M24
- 2. Brake fluid level switch E21
- 5. Steering angle sensor (behind spiral cable) M47
- ABS actuator and electric unit (control unit) E125
- 6. Yaw rate/side/decel G sensor B73

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Rear wheel sensor RH C13

Rear wheel sensor LH C13

VDC OFF switch M154 9.

10. HDC switch M155

11. Stop lamp switch E38

12. Stop lamp relay E12

Component Description

INFOID:0000000003937886

Compo	nent parts	Reference
	Pump	BRC-168, "Description"
	Motor	BRC-100, Description
ABS actuator and electric unit (control unit)	Actuator relay	BRC-186, "Description"
, 120 desidato, dina electric dina (comi el dina)	Solenoid valve	BRC-178, "Description"
	VDC switch-over valve (CV1, CV2, SV1, SV2)	BRC-196, "Description"
Wheel sensor		BRC-173, "Description"
Yaw rate/side/decel G sensor		BRC-170, "Description"
Steering angle sensor		BRC-188, "Description"
VDC OFF switch		BRC-200, "Description"
ABS warning lamp		BRC-202, "Description"
Brake warning lamp		BRC-203, "Description"
VDC OFF indicator lamp		BRC-204, "Description"
SLIP indicator lamp		BRC-205, "Description"

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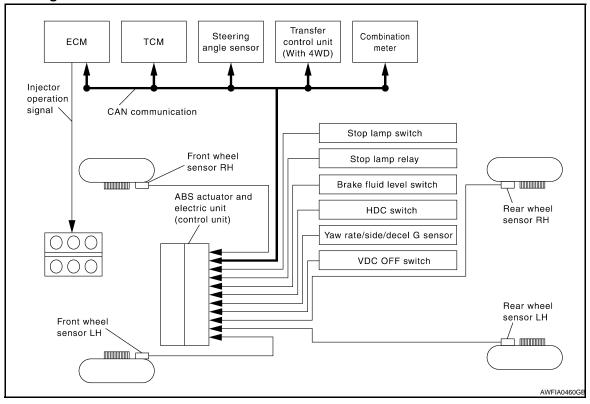
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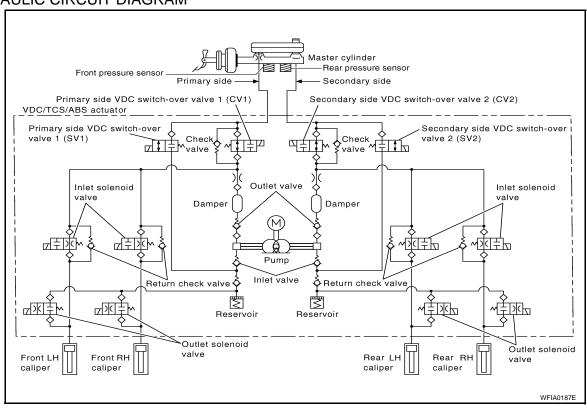
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System Diagram



HYDRAULIC CIRCUIT DIAGRAM



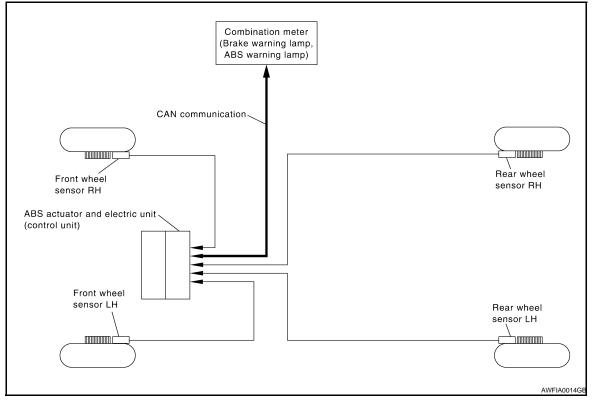
System Description

INFOID:0000000003937888

- Traction Control System is a function that electronically controls engine torque, brake fluid pressure and A/T gear position to ensure the optimum slippage ratio at drive wheels by computing wheel speed signals from 4 wheel sensors. When ABS actuator and electric unit (control unit) detects a spin at drive wheels (rear wheels), it compares wheel speed signals from all 4 wheels. At this time, LH and RH rear brake fluid pressure are controlled, while fuel being cut to engine and throttle valve being closed to reduce engine torque by the control unit. Further more, throttle position is continuously controlled to ensure the optimum engine torque at all times.
- During TCS operation, it informs driver of system operation by flashing SLIP indicator lamp.
- Electrical system diagnosis by CONSULT-III is available.

ABS

System Diagram



System Description

INFOID:0000000003937890

 Anti-Lock Braking System is a function that detects wheel revolution while braking, electronically controls braking force, and prevents wheel locking during sudden braking. It improves handling stability and maneuverability for avoiding obstacles.

• Electrical system diagnosis by CONSULT-III is available.

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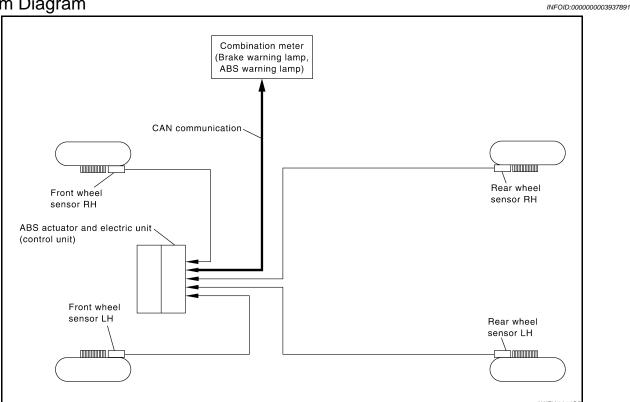
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EBD

System Diagram



System Description

INFOID:0000000003937892

- Electric Brake force Distribution is a following function. ABS actuator and electric unit (control unit) detects subtle slippages between the front and rear wheels during braking. Then it electronically controls the rear braking force (brake fluid pressure) to reduce rear wheel slippage. Accordingly, it improves vehicle stability.
- Electrical system diagnosis by CONSULT-III is available.

< FUNCTION DIAGNOSIS > [TYPE 2]

DIAGNOSIS SYSTEM [ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)]

CONSULT-III Function (ABS)

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FUNCTION

CONSULT-III can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic test mode	Function	
Work support	Supports inspections and adjustments. Commands are transmitted to the ABS actuator and electric unit (control unit) for setting the status suitable for required operation, input/output signals are received from the ABS actuator and electric unit (control unit) and received data is displayed.	
Data monitor	Displays ABS actuator and electric unit (control unit) input/output data in real time.	
Active test	Operation of electrical loads can be checked by sending drive signals to them.	
Self-diagnostic result	Displays ABS actuator and electric unit (control unit) self-diagnosis results.	
CAN diag support monitor	The result of transmit/receive diagnosis of CAN communication can be read.	
ECU identification	ABS actuator and electric unit (control unit) part number can be read.	

SELF-DIAG RESULTS MODE

Operation Procedure

1. Before performing the self-diagnosis, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute.

How to Erase Self-diagnosis Results

 After erasing DTC memory, start engine and drive vehicle at 30 km/h (19 MPH) or more for approximately 1 minute as the final inspection, and make sure that the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp turn OFF.

CAUTION:

If memory cannot be erased, perform applicable diagnosis. NOTE:

- When the wheel sensor malfunctions, after inspecting the wheel sensor system, the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp will not turn OFF even when the system is normal unless the vehicle is driving at approximately 30 km/h (19 MPH) or more for approximately 1 minute.
- Brake warning lamp will turn ON in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- VDC OFF switch should not stay "ON" position.

Display Item List

Refer to BRC-218, "DTC No. Index".

DATA MONITOR MODE

Display Item List

H	Data	a monitor item sele			
Item (Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
GEAR (1, 2, 3, 4, 5)	×	×	×	Gear position determined by TCM is displayed.	
FR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front RH wheel sensor signal is displayed.	
FR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by front LH wheel sensor signal is displayed.	
RR RH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear RH wheel sensor signal is displayed.	

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< FUNCTION DIAGNOSIS >

[TYPE 2]

Item	Data	a monitor item sel	ection		
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks	
RR LH SENSOR (km/h, MPH)	×	×	×	Wheel speed calculated by rear LH wheel sensor signal is displayed.	
BATTERY VOLT (V)	×	×	×	Voltage supplied to ABS actuator and electric unit (control unit) is displayed.	
N POSI SIG (ON/OFF)	-	-	×	Shift position (ON/OFF) judged by PNP switch signal.	
P POSI SIG (ON/OFF)	-	-	×	Shift position (ON/OFF) judged by PNP switch signal.	
ACCEL POS SIG (%)	×	-	×	Throttle valve open/close status judged by CAN communication signal is displayed.	
ENGINE SPEED (rpm)	×	×	×	Engine speed judged by CAN communication signal is displayed.	
STR ANGLE SIG (deg)	×	-	×	Steering angle detected by steering angle sensor is displayed.	
YAW RATE SEN (d/s)	×	×	×	Yaw rate detected by yaw rate sensor is displayed.	
SIDE G-SENSOR (m/s²)	×	-	×	Transverse acceleration detected by side G-sensor is displayed.	
STOP LAMP SW (ON/OFF)	×	×	×	Stop lamp switch (ON/OFF) status is displayed.	
OFF SW (ON/OFF)	×	×	×	VDC OFF switch (ON/OFF) status is displayed.	
ABS WARN LAMP (ON/OFF)	-	×	×	ABS warning lamp (ON/OFF) status is displayed.	
SLIP LAMP (ON/OFF)	-	×	×	SLIP indicator lamp (ON/OFF) status is displayed.	
FR LH IN SOL (ON/OFF)	-	×	×	Front LH IN ABS solenoid (ON/ OFF) status is displayed.	
FR LH OUT SOL (ON/OFF)	-	×	×	Front LH OUT ABS solenoid (ON/OFF) status is displayed.	
RR RH IN SOL (ON/OFF)	-	×	×	Rear RH IN ABS solenoid (ON/ OFF) status is displayed.	
RR RH OUT SOL (ON/OFF)	-	×	×	Rear RH OUT ABS solenoid (ON/ OFF) status is displayed.	
FR RH IN SOL (ON/OFF)	-	×	×	Front RH IN ABS solenoid (ON/ OFF) status is displayed.	
FR RH OUT SOL (ON/OFF)	_	×	×	Front RH OUT ABS solenoid (ON/ OFF) status is displayed.	
RR LH IN SOL (ON/OFF)	_	×	×	Rear LH IN ABS solenoid (ON/OFF) status is displayed.	
RR LH OUT SOL (ON/OFF)	_	×	×	Rear LH OUT ABS solenoid (ON/OFF) status is displayed.	
OFF LAMP (ON/OFF)	_	×	×	OFF Lamp (ON/OFF) status is displayed.	
MOTOR RELAY (ON/OFF)	_	×	×	ABS motor relay signal (ON/OFF) status is displayed.	
ACTUATOR RLY (ON/OFF)	_	×	×	ABS actuator relay signal (ON/OFF) status is displayed.	

< FUNCTION DIAGNOSIS > [TYPE 2]

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Item	Data	a monitor item sele	ection	
(Unit)	ECU INPUT SIGNALS	MAIN SIGNALS	SELECTION FROM MENU	Remarks
CV1 (ON/OFF)	-	_	×	Front side switch-over solenoid valve (cut valve) (ON/OFF) status is displayed.
CV2 (ON/OFF)	-	_	×	Rear side switch-over solenoid valve (cut-valve) (ON/OFF) status is displayed.
SV1 (ON/OFF)	-	_	×	Front side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
SV2 (ON/OFF)	-	_	×	Rear side switch-over solenoid valve (suction valve) (ON/OFF) status is displayed.
VDC FAIL SIG (ON/OFF)	-	-	×	VDC fail signal (ON/OFF) status is displayed.
TCS FAIL SIG (ON/OFF)	-	_	×	TCS fail signal (ON/OFF) status is displayed.
ABS FAIL SIG (ON/OFF)	-	_	×	ABS fail signal (ON/OFF) status is displayed.
EBD FAIL SIG (ON/OFF)	-	-	×	EBD fail signal (ON/OFF) status is displayed.
FLUID LEV SW (ON/OFF)	×	-	×	Brake fluid level switch (ON/OFF) status is displayed.
EBD SIGNAL (ON/OFF)	-	-	×	EBD operation (ON/OFF) status is displayed.
ABS SIGNAL (ON/OFF)	-	-	×	ABS operation (ON/OFF) status is displayed.
TCS SIGNAL (ON/OFF)	-	-	×	TCS operation (ON/OFF) status is displayed.
VDC SIGNAL (ON/OFF)	-	-	×	VDC operation (ON/OFF) status is displayed.
EBD WARN LAMP (ON/OFF)	-	-	×	Brake warning lamp (ON/OFF) status is displayed.
SLCT LVR POSI (P, R, N, D)	×	×	×	Shift position judged by PNP switch signal.
R POSI SIG (ON/OFF)	-	-	×	Shift position judged by PNP switch signal.
2WD/4WD (2WD/4WD)	-	_	×	It recognizes on software whether i is 2WD and whether it is in 4WD state.
DECEL G-SEN (G)	×	×	×	Longitudinal acceleration detected by decel G-sensor is displayed.
PRESS SENSOR (bar)	×	-	×	Brake pressure detected by pressure sensor is displayed.
CRANKING SIG (ON/OFF)	-	-	×	The input state of the key SW START position signal is displayed

^{×:} Applicable

ACTIVE TEST MODE

CAUTION:

- Do not perform active test while driving vehicle.
- Make sure to completely bleed air from brake system.

^{-:} Not applicable

< FUNCTION DIAGNOSIS >

[TYPE 2]

- The active test cannot be performed with the ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp or brake warning lamp on.
- ABS warning lamp, VDC OFF indicator lamp, SLIP indicator lamp and brake warning lamp are on during active test.

NOTE:

- When active test is performed while depressing the pedal, the pedal depression amount will change. This is normal. (Only solenoid valve and ABS motor.)
- "TEST IS STOPPED" is displayed 10 seconds after operation start.
- After "TEST IS STOPPED" is displayed, to perform test again, touch BACK.

Test Item

SOLENOID VALVE

- When performing an active test of the ABS function, select the "MAIN SIGNALS" for each test item. In addition, when performing an active test of the VDC/TCS function, select the item menu for each test item.
- For ABS solenoid valve, touch "Up", "Keep", and "Down" on the display screen. For ABS solenoid valve (ACT), touch "Up", "ACT UP", "ACT KEEP" and confirm that solenoid valves operate as shown in the table below.

Operation		ABS solenoid valve		ABS solenoid valve (ACT)			
		Up	Keep	Down	Up	ACT UP	ACT KEEP
ED DIT COL	FR RH IN SOL	Off	On	On	_	_	_
FR RH SOL	FR RH OUT SOL	Off	Off	On*	_	_	_
FR LH SOL	FR LH IN SOL	Off	On	On	_	_	_
FR LH SOL	FR LH OUT SOL	Off	Off	On*	_	_	_
RR RH SOL	RR RH IN SOL	Off	On	On	_	_	_
KK KH SUL	RR RH OUT SOL	Off	Off	On*	_	_	_
RR LH SOL	RR LH IN SOL	Off	On	On	_	_	_
KK LH SOL	RR LH OUT SOL	Off	Off	On*	_	_	_
	FR RH IN SOL	_	_	_	Off	Off	Off
FR RH ABS SOLENOID (ACT)	FR RH OUT SOL	_	_	_	Off	Off	Off
FR RH ABS SOLENOID (ACT)	CV1	_	_	_	Off	On	On
	SV1	_	_	_	Off	On*	Off
FR LH ABS SOLENOID (ACT)	FR LH IN SOL	_	_	_	Off	Off	Off
	FR LH OUT SOL	_	_	_	Off	Off	Off
	CV1	_	_	_	Off	On	On
	SV1	_	_	_	Off	On*	Off
	RR RH IN SOL	_	_	_	Off	Off	Off
RR RH ABS SOLENOID (ACT)	RR RH OUT SOL	_	_	_	Off	Off	Off
KK KH ABS SOLENOID (ACT)	CV2	_	_	_	Off	On	On
	SV2	_	_	_	Off	On*	Off
DD LLI ADO COL ENOID (ACT)	RR LH IN SOL		_	_	Off	Off	Off
	RR LH OUT SOL	_	_	_	Off	Off	Off
RR LH ABS SOLENOID (ACT)	CV2	_	_	_	Off	On	On
	SV2	_	_	_	Off	On*	Off
REAR SOL	This item is not use	d for this mod	del.			•	

^{*:} On for 1 to 2 seconds after the touch, and then Off

ABS MOTOR

Touch "On" and "Off" on screen. Make sure motor relay and actuator relay operates as shown in table below.

< FUNCTION DIAGNOSIS >

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Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

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COMPONENT DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks	
TYPE 1	VDC/TCS/ABS	
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

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C1101, C1102, C1103, C1104 WHEEL SENSOR-1

Description

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1101	RR RH SENSOR-1	Circuit of rear RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	
C1102	RR LH SENSOR-1	Circuit of rear LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	Harness or connectorWheel sensor
C1103	FR RH SENSOR-1	Circuit of front RH wheel sensor is open. Or when the sensor power voltage is outside the standard.	ABS actuator and electric unit (control unit)
C1104	FR LH SENSOR-1	Circuit of front LH wheel sensor is open. Or when the sensor power voltage is outside the standard.	

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-1
RR LH SENSOR-1
FR RH SENSOR-1
FR LH SENSOR-1

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-159, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

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CAUTION:

Do not check between wheel sensor terminals.

1. CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- 1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

BRC-159

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If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-234, "Removal and Installation".

3. CHECK TIRES

Check for inflation pressure, wear and size of each tire.

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "<u>On-Vehicle Inspection and Service</u>" (front) or <u>RAX-5</u>, "<u>On-Vehicle Inspection and Service</u>" (rear).

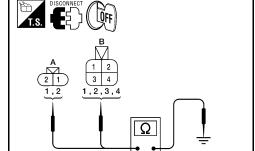
Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

CHECK WIRING HARNESS FOR SHORT CIRCUIT

- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- 2. Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.



Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) connector E125 and the malfunctioning wheel sensor connector E18, E117 or C13.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	nal Connector Termina		
Front LH		45	E18	1	Yes
Front LH		46		2	
Front RH		34	E117	1	
		33		2	
Poor I U		37		3	
Real LIT		36		4	
Rear RH	-	42		1	
		43		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-236</u>, "Removal and Installation".

NO >> Repair the circuit.

C1101, C1102, C1103, C1104 WHEEL SENSOR-1

< COMPONENT DIAGNOSIS >

[TYPE 2]

Component Inspection

INFOID:0000000003937898

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-159</u>, "<u>Diagnosis Procedure</u>".

Special Repair Requirement

INFOID:0000000003937899

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

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C1105, C1106, C1107, C1108 WHEEL SENSOR-2

Description INFOID:000000003937900

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1105	RR RH SENSOR-2	When the circuit in the rear RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	
C1106	RR LH SENSOR-2	When the circuit in the rear LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	Harness or connectorWheel sensor
C1107	FR RH SENSOR-2	When the circuit in the front RH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	ABS actuator and electric unit (control unit)
C1108	FR LH SENSOR-2	When the circuit in the front LH wheel sensor is short-circuited. Or when the distance between the wheel sensor and sensor rotor is too large and the sensor pulse cannot be recognized by the control unit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
RR RH SENSOR-2
RR LH SENSOR-2
FR RH SENSOR-2
FR LH SENSOR-2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-162, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004422068

CAUTION:

Do not check between wheel sensor terminals.

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunctioning code.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

1. Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.

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2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YES >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-234, "Removal and Installation".

${f 3.}$ CHECK TIRES

Check for inflation pressure, wear and size of each tire.

Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4. CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle Inspection and Service" (front) or <u>RAX-5</u>, "On-Vehicle Inspection and Service" (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

5.CHECK WIRING HARNESS FOR SHORT CIRCUIT

- Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

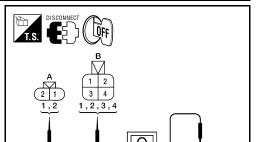
NO >> Repair the circuit.

6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

 Check continuity between ABS actuator and electric unit (control unit) connector E125 and the malfunctioning wheel sensor connector E18, E117 or C13.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector Terminal		
Franklill		45	E18	1	Vec
Front LH	-	46		2	
Front RH		34	E117	1	
		33		2	
Rear LH	- E125	37		3	Yes
Real Ln		36	C13	4	
Rear RH		42		1	
NEAI NII		43		2	

Is the inspection result normal?



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C1105, C1106, C1107, C1108 WHEEL SENSOR-2

< COMPONENT DIAGNOSIS >

[TYPE 2]

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-236</u>, "Removal and Installation".

NO >> Repair the circuit.

Component Inspection

INFOID:0000000003937903

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)	
FR LH SENSOR		
FR RH SENSOR	Nearly matches the speedometer dis-	
RR LH SENSOR	play (±10% or less)	
RR RH SENSOR		

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-162, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003937904

1.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel G sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-13, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

< COMPONENT DIAGNOSIS >

[TYPE 2]

C1109 POWER AND GROUND SYSTEM

Description

Supplies electric power to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1109	BATTERY VOLTAGE [ABNORMAL]	When the ABS actuator and electric unit (control unit) power supply voltage is lower than normal.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BATTERY VOLTAGE [ABNORMAL]

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-165, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

1. CHECK CONNECTOR

1. Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-153, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

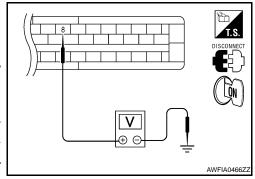
YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.check abs actuator and electric unit (control unit) power supply circuit and ground circuit

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Turn ignition switch ON or OFF and check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 8 and ground.

ABS actuator and elec- tric unit (control unit)		_	Condition	Voltage
Connector	Terminal			
F125	E125 8	Ground	Ignition switch: ON	Battery voltage
L 123 0		Ground	Ignition switch: OFF	Approx. 0V



4. Turn ignition switch OFF.

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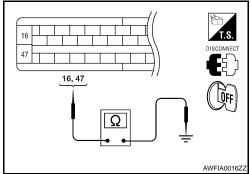
C1109 POWER AND GROUND SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

 Check continuity between ABS actuator and electric unit (control unit) connector E125 terminals 16, 47 and ground.

ABS actuator and electric unit (control unit)		_	Continuity
Connector	Terminal		
E125	16, 47	Ground	Yes



Is the inspection result normal?

- YES >> Check battery for terminal looseness, low voltage, etc. If any malfunction is found, repair malfunctioning parts.
- NO >> Repair or replace malfunctioning components.

Special Repair Requirement

INFOID:0000000003937908

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141. "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) **[TYPE 2]** < COMPONENT DIAGNOSIS > C1110, C1170 ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) Α DTC Logic INFOID:0000000003937909 DTC DETECTION LOGIC В DTC Malfunction detected condition Possible cause Display item When there is an internal malfunction in the ABS actuator C1110 **CONTROLLER FAILURE** · ABS actuator and electric unit and electric unit (control unit). (control unit) C1170 VARIANT CODING In a case where VARIANT CODING is different. D DTC CONFIRMATION PROCEDURE 1. CHECK SELF-DIAGNOSIS RESULTS Check the self-diagnosis results. Self-diagnosis results **BRC** CONTROLLER FAILURE VARIANT CODING Is above displayed on the self-diagnosis display? >> Proceed to diagnosis procedure. Refer to BRC-167, "Diagnosis Procedure". YES NO >> Inspection End Diagnosis Procedure INFOID:0000000003937910 INSPECTION PROCEDURE 1. REPLACE ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation". Special Repair Requirement INFOID:0000000003937911 ${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-

TRAL POSITION: Description".

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>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1111 ABS MOTOR, MOTOR RELAY SYSTEM

Description INFOID:000000003937912

PUMP

The pump returns the brake fluid stored in the reservoir to the master cylinder by reducing the pressure.

MOTOR

The motor drives the pump according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1111	PUMP MOTOR	During the actuator motor operating with ON, when the actuator motor turns OFF, or when the control line for actuator motor relay is open.	Harness or connector ABS actuator and electric unit
OIIII		During the actuator motor operating with OFF, when the actuator motor turns ON, or when the control line for relay is shorted to ground.	(control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
PUMP MOTOR

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-168</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937914

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnect, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to BRC-153, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK ABS MOTOR AND MOTOR RELAY POWER SUPPLY CIRCUIT

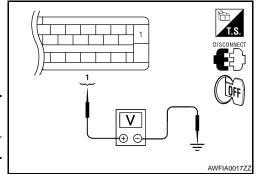
C1111 ABS MOTOR, MOTOR RELAY SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connec-
- 3. Check voltage between the ABS actuator and electric unit (control unit) harness connector terminal and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		voltage
E125	1	Ground	Battery voltage



Is the inspection result normal?

>> GO TO 3 YES

NO >> Repair or replace malfunctioning components.

3.CHECK ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT) GROUND CIRCUIT

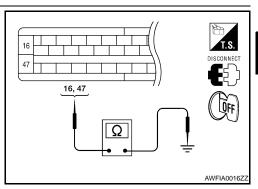
Check continuity between ABS actuator and electric unit (control unit) harness connector terminals and ground.

ABS actuator and ele	ectric unit (control unit)	— Continuit	
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



Component Inspection

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch ON and OFF on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	ON	OFF
MOTOR RELAY	ON	OFF
ACTUATOR RLY	ON	ON

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to <u>BRC-168</u>, "Diagnosis Procedure".

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

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C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

Description INFOID.000000003937917

The yaw rate/side/decel G sensor detects the yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1113	G-SENSOR	Longitudinal G-sensor is malfunctioning, or signal line of longitudinal G-sensor is open or shorted.	Harness or connector	
C1145	YAW RATE SENSOR	Yaw rate sensor is malfunctioning, or the yaw rate sensor signal line is open or shorted.	ABS actuator and electric unit (control unit)	
C1146	SIDE G-SEN CIRCUIT	Side G sensor is malfunctioning, or circuit of side G sensor is open or shorted.	Yaw rate/side/decel G sensor	

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
G-SENSOR
YAW RATE SENSOR
SIDE G-SEN CIRCUIT

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-170</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

CAUTION:

- Sudden turns (such as spin turns, acceleration turns), drifting, etc. when VDC function is OFF may
 cause the yaw rate/side/decel G sensor system to indicate a malfunction. This is not a malfunction if
 normal operation can be resumed after restarting the engine.
- If vehicle is on turn table at entrance to parking garage, or on other moving surface, VDC OFF indicator lamp may illuminate and CONSULT-III self-diagnosis may indicate yaw rate sensor system malfunction. However, in this case there is no malfunction in yaw rate sensor system. Take vehicle off of turn table or other moving surface, and start engine. Results will return to normal.

1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and yaw rate/side/decel G sensor connector.

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.YAW RATE/SIDE/DECEL G SENSOR HARNESS INSPECTION

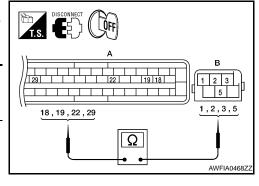
C1113, C1145, C1146 YAW RATE/SIDE/DECEL G SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 2]

Check continuity between the ABS actuator and electric unit (control unit) connector E125 (A) and the yaw rate/side/decel G sensor connector B73 (B).

	and electric unit ol unit)	Yaw rate/side/decel G sensor		Continuity
Connector	Terminal	Connector	Terminal	
	18		2	Yes
E40E (A)	19	B73 (B)	1	
E125 (A)	22		3	res
	29		5	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace as necessary.

3.YAW RATE/SIDE/DECEL G SENSOR INSPECTION

- Connect the yaw rate/side/decel G sensor connector and ABS actuator and electric unit (control unit) connector.
- Perform the yaw rate/side/decel G sensor component inspection. Refer to <u>BRC-171, "Component Inspection"</u>.

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace the ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-239, "Removal and Installation".

Component Inspection

INFOID:0000000003937920

1. CHECK DATA MONITOR

Select "YAW RATE SEN", "SIDE G-SENSOR", "DECEL G-SEN" in "DATA MONITOR" and check yaw rate/side/decel G sensor signal.

YAW RATE SEN (DATA MONITOR)	SIDE G-SENSOR (DATA MONITOR)	DECEL G-SEN (DATA MONITOR)
,	,	
-4 to +4 deg/s	-1.1 to +1.1 m/s	-0.11 G to +0.11 G
Negative value	Negative value	-
Positive value	Positive value	-
-	-	Negative value
		Positive value
_	9	0

Is the inspection result normal?

YES >> Inspection End

NO >> Replace the yaw rate/side/decel G sensor. Refer to BRC-239, "Removal and Installation".

Special Repair Requirement

INFOID:0000000003937921

1.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

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C1115 WHEEL SENSOR

Description INFOID:0000000003937922

When the sensor rotor rotates, the magnetic field changes. It converts the magnetic field changes to current signals (rectangular wave) and transmits them to the ABS actuator and electric unit (control unit).

DTC Logic INFOID:0000000003937923

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1115	ABS SENSOR [ABNORMAL SIGNAL]	When wheel sensor input signal is malfunctioning.	Harness or connector Wheel sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results ABS SENSOR [ABNORMAL SIGNAL]

Is above displayed on the self-diagnosis display?

>> Proceed to diagnosis procedure. Refer to BRC-173, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

CAUTION:

Do not check between wheel sensor terminals. 1.CONNECTOR INSPECTION

Disconnect the ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunc-

Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK WHEEL SENSOR OUTPUT SIGNAL

- Connect ABS active wheel sensor tester (J-45741) to wheel sensor using appropriate adapter.
- 2. Turn on the ABS active wheel sensor tester power switch.

NOTE:

The green POWER indicator should illuminate. If the POWER indicator does not illuminate, replace the battery in the ABS active wheel sensor tester before proceeding.

3. Spin the wheel of the vehicle by hand and observe the red SENSOR indicator on the ABS active wheel sensor tester. The red SENSOR indicator should flash on and off to indicate an output signal.

NOTE:

If the red SENSOR indicator illuminates but does not flash, reverse the polarity of the tester leads and retest.

Does the ABS active wheel sensor tester detect a signal?

YFS >> GO TO 3

NO >> Replace the wheel sensor. Refer to BRC-234, "Removal and Installation".

3.CHECK TIRES

Check for inflation pressure, wear and size of each tire.

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Are tire pressure and size correct and is tire wear within specifications?

YES >> GO TO 4

NO >> Adjust tire pressure or replace tire(s).

4.CHECK WHEEL BEARINGS

Check wheel bearing axial end play. Refer to <u>FAX-5</u>, "On-Vehicle <u>Inspection and Service"</u> (front) or <u>RAX-5</u>, "On-Vehicle <u>Inspection and Service"</u> (rear).

Is the inspection result normal?

YES >> GO TO 5

NO >> Repair or replace as necessary. Refer to <u>FAX-9</u>, "<u>Removal and Installation</u>" (front) or <u>RAX-8</u>, "<u>Removal and Installation</u>" (rear).

5. CHECK WIRING HARNESS FOR SHORT CIRCUIT

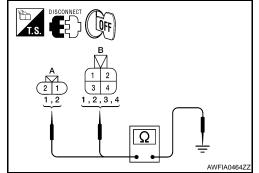
- 1. Disconnect ABS actuator and electric unit (control unit) connector and wheel sensor connector of malfunction code No.
- Check continuity between front wheel sensor connector terminals (A) or rear wheel sensor connector terminals (B) and ground.

Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 6

NO >> Repair the circuit.



6. CHECK WIRING HARNESS FOR OPEN CIRCUIT

1. Check continuity between ABS actuator and electric unit (control unit) connector E125 and the malfunctioning wheel sensor connector E18, E117 or C13.

Wheel sensor	ABS actuator and electric unit (control unit)		Wheel sensor		Continuity
	Connector	Terminal	Connector	Terminal	•
Front LH		45	45 46 E18	1	Yes
FIOIIL LA	- E125	46		2	
Front RH Rear LH Rear RH		34	E117	1	
		33		2	
		37	C13	3	
		36		4	
		42		1	
		43		2	

Is the inspection result normal?

YES >> Replace the ABS actuator and electric unit (control unit). Refer to <u>BRC-236, "Removal and Installation".</u>

NO >> Repair the circuit.

Component Inspection

INFOID:0000000003937925

1. CHECK DATA MONITOR

On "DATA MONITOR", select "FR LH SENSOR", "FR RH SENSOR", "RR LH SENSOR", and "RR RH SENSOR", and check the vehicle speed.

Wheel sensor	Vehicle speed (DATA MONITOR)

C1115 WHEEL SENSOR

< COMPONENT DIAGNOSIS >	[TYPE 2]
FR LH SENSOR	
FR RH SENSOR	Nearly matches the speedometer dis-
RR LH SENSOR	play (±10% or less)
RR RH SENSOR	
Is the inspection result normal?	
YES >> Inspection End NO >> Go to diagnosis proce	edure. Refer to <u>BRC-173, "Diagnosis Procedure"</u> .
Special Repair Requireme	nt INFOID:0000000003937926
1.ADJUSTMENT OF STEERING	ANGLE SENSOR NEUTRAL POSITION
Always perform neutral position a and electric unit (control unit). Ref POSITION: Description".	adjustment for the steering angle sensor when replacing the ABS actuator for to BRC-12, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL
>> GO TO 2	
2.CALIBRATION OF DECEL G $$$	SENSOR
	el G sensor when replacing the ABS actuator and electric unit (control unit). OF DECEL G SENSOR: Description".
>> END	

C1116 STOP LAMP SWITCH

Description INFOID:000000003937927

The stop lamp switch transmits the stop lamp switch signal (ON/OFF) to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1116	STOP LAMP SW	When stop lamp switch circuit is open.	Harness or connector Stop lamp switch ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
STOP LAMP SW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-176, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937929

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Disconnect the ABS actuator and electric unit (control unit) connector and stop lamp switch connector.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2 . STOP LAMP SWITCH INSPECTION

Check voltage between ABS actuator and electric unit (control unit) connector E125 terminal 39 and body ground.

Brake pedal depressed : Battery voltage

(approx. 12V)

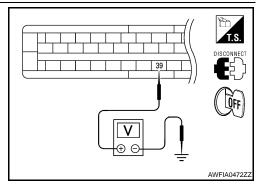
Brake pedal not depressed : Approx. 0V

Is the inspection result normal?

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> GO TO 3

3.STOP LAMP RELAY CIRCUIT INSPECTION



C1116 STOP LAMP SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

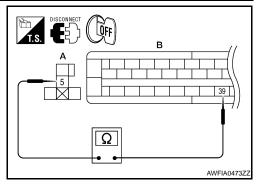
- 1. Disconnect stop lamp relay connector.
- Check continuity between stop lamp relay connector E12 (A) terminal 5 and ABS actuator and electric unit (control unit) connector E125 (B) terminal 39.

Continuity should exist.

Is the inspection result normal?

YES >> Refer to EXL-4, "Work Flow".

NO >> Repair or replace malfunctioning components.



INFOID:0000000003937930

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".</u>

>> GO TO 2

2. CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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C1120, C1122, C1124, C1126 IN ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1120	FR LH IN ABS SOL	When the control unit detects a malfunction in the front LH inlet solenoid circuit.	
C1122	FR RH IN ABS SOL	When the control unit detects a malfunction in the front RH inlet solenoid circuit.	ABS actuator and electric unit
C1124	RR LH IN ABS SOL	When the control unit detects a malfunction in the rear LH inlet solenoid circuit.	(control unit)
C1126	RR RH IN ABS SOL	When the control unit detects a malfunction in the rear RH inlet solenoid circuit.	

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH IN ABS SOL
FR RH IN ABS SOL
RR LH IN ABS SOL
RR RH IN ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-178, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937933

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-153, "CONSULT-III Function</u> (<u>ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

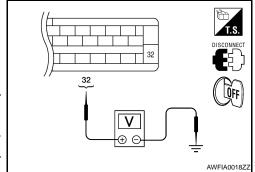
C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

1. Turn ignition switch OFF.

- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage	
Connector	Terminal			
E125	32	Ground	Battery voltage	



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity	
Connector	Terminal	_ 00	Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-236</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

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Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve		
		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR KH SOL	FR RH OUT SOL	Off	Off	On*
ED LU COL	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
KK KH SOL	RR RH OUT SOL	Off	Off	On*
DD LLI COL	RR LH IN SOL	Off	On	On
RR LH SOL	RR LH OUT SOL	Off	Off	On*
REAR SOL	This item is not used for thi	This item is not used for this model.		

^{*:} On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-178, "Diagnosis Procedure".

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

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C1120, C1122, C1124, C1126 IN ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1121, C1123, C1125, C1127 OUT ABS SOL

Description

The solenoid valve increases, holds or decreases the fluid pressure of each brake caliper according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1121	FR LH OUT ABS SOL	When the control unit detects a malfunction in the front LH outlet solenoid circuit.		
C1123	FR RH OUT ABS SOL	When the control unit detects a malfunction in the front RH outlet solenoid circuit.	ABS actuator and electric unit	
C1125	RR LH OUT ABS SOL	When the control unit detects a malfunction in the rear LH outlet solenoid circuit.	(control unit)	
C1127	RR RH OUT ABS SOL	When the control unit detects a malfunction in the rear RH outlet solenoid circuit.		

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
FR LH OUT ABS SOL
FR RH OUT ABS SOL
RR LH OUT ABS SOL
RR RH OUT ABS SOL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-181</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-153, "CONSULT-III Function (ABS)"</u>.

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

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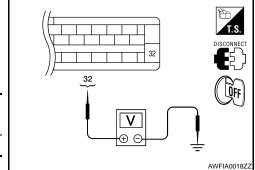
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INFOID:0000000004422072

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector Terminal			voitage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

${f 3.}$ CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACUATOR RELAY GROUND CIRCUIT

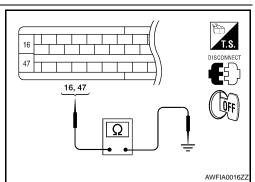
Check continuity between ABS actuator and electric unit (control unit) harness connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal	_	Continuity
E125	16, 47	Ground	Yes

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-236</u>, "Removal and Installation".

NO >> Repair or replace malfunctioning components.



INFOID:0000000004427368

[TYPE 2]

Component Inspection

1. CHECK ACTIVE TEST

- 1. Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "Keep", and "Down", and check that the system operates as shown in the table below.

Operati	on.		ABS solenoid valve	9
Operation		Up	Keep	Down
FR RH SOL	FR RH IN SOL	Off	On	On
FR RH 30L	FR RH OUT SOL	Off	Off	On*
FR LH SOL	FR LH IN SOL	Off	On	On
FR LH SOL	FR LH OUT SOL	Off	Off	On*
RR RH SOL	RR RH IN SOL	Off	On	On
KK KH 30L	RR RH OUT SOL	Off	Off	On*
RR LH SOL	RR LH IN SOL	Off	On	On
KK LFI SOL	RR LH OUT SOL	Off	Off	On*
REAR SOL	This item is not used for thi	s model.	.t	

^{*:} On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-178, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003937940

1.ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

BRC-182

C1121, C1123, C1125, C1127 OUT ABS SOL

< COMPONENT DIAGNOSIS >

[TYPE 2]

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

В

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

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C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

Description INFOID:0000000003937941

ABS actuator and electric unit (control unit) and ECM exchange the engine signal with CAN communication line.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1130	ENGINE SIGNAL 1		
C1131	ENGINE SIGNAL 2	unit (control unit) judges that engine fuel cut system is malfunctioning.	 Harness or connector ABS actuator and electric unit (control unit) ECM CAN communication line
C1132	ENGINE SIGNAL 3		
C1133	ENGINE SIGNAL 4		
C1136	ENGINE SIGNAL 6		

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ENGINE SIGNAL 1
ENGINE SIGNAL 2
ENGINE SIGNAL 3
ENGINE SIGNAL 4
ENGINE SIGNAL 6

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-184</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937943

INSPECTION PROCEDURE

1. CHECK ENGINE SYSTEM

- 1. Perform ECM self-diagnosis. Repair or replace items indicated, then perform ECM self-diagnosis again. Refer to EC-73, "CONSULT-III Function (ENGINE)".
- Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> Repair or replace the affected part.

NO >> Inspection End

Special Repair Requirement

INFOID:0000000003937944

${f 1}$.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

C1130, C1131, C1132, C1133, C1136 ENGINE SIGNAL

< COMPONENT DIAGNOSIS >

[TYPE 2]

$\overline{2}$.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

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C1140 ACTUATOR RLY

Description INFOID.000000003937945

Activates or deactivates each solenoid valve according to the signals transmitted by the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1140	ACTUATOR RLY	ABS actuator relay or circuit malfunction.	Harness or connector ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ACTUATOR RLY

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-186, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004422071

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

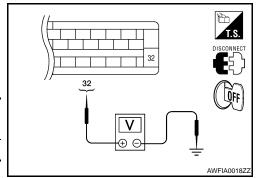
YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- Disconnect ABS actuator and electric unit (control unit) connector.
- Check voltage between ABS actuator and electric unit (control unit) harness connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Connector Terminal		voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

C1140 ACTUATOR RLY

< COMPONENT DIAGNOSIS >

[TYPE 2]

Check continuity between ABS actuator and electric unit (control unit) harness connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Terminal		Continuity
E125	16, 47	Ground	Yes

47 16, 47

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

Component Inspection

INFOID:0000000003937948

1. CHECK ACTIVE TEST

- On "ACTIVE TEST", select "ABS MOTOR".
- Touch On and Off on screen. Make sure motor relay and actuator relay operates as shown in table below.

Operation	On	Off
MOTOR RELAY	On	Off
ACTUATOR RLY	On	On

Is the inspection result normal?

YES >> Inspection End

>> Go to diagnosis procedure. Refer to <u>BRC-186</u>, "Diagnosis Procedure". NO

Special Repair Requirement

INFOID:0000000003937949

${f 1}$.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: Description".

>> GO TO 2

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2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

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C1143, C1144 STEERING ANGLE SENSOR

Description INFOID.000000003937955

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1143	ST ANG SEN CIRCUIT	Neutral position of steering angle sensor is dislocated, or the steering angle sensor is malfunctioning.	Harness or connector Steering angle sensor
C1144	ST ANG SEN SIGNAL	Neutral position of steering angle sensor is not finished.	ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANG SEN CIRCUIT
ST ANG SEN SIGNAL

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-188</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937957

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- 3. Disconnect steering angle sensor connector.
- 4. Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-153</u>, "<u>CONSULT-III Function</u> (<u>ABS</u>)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.check steering angle sensor harness

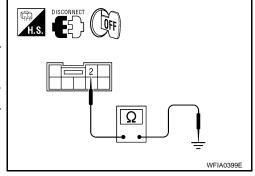
- Turn ignition switch OFF.
- Disconnect steering angle sensor connector.

< COMPONENT DIAGNOSIS >

[TYPE 2]

Check continuity between steering angle sensor connector M47 terminal 2 and ground.

Steering a	ngle sensor	_	Continuity
Connector	Terminal		Continuity
M47	2	Ground	Yes



Turn ignition switch ON.

Check voltage between steering angle sensor connector M47 terminal 3 and ground.

Steering angle sensor			Voltage
Connector	Terminal		voltage
M47	3	Ground	Battery voltage

Is the inspection result normal?

YFS >> GO TO 3

NO >> Repair or replace malfunctioning components.

3. CHECK DATA MONITOR

- Connect the steering angle sensor connector and ABS actuator and electric unit (control unit) connector.
- Perform the steering angle sensor component inspection. Refer to BRC-189, "Component Inspection".

Is the inspection result normal?

- YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".
- NO >> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-238, "Removal and Installation".

Component Inspection

1. CHECK DATA MONITOR

Select "STR ANGLE SIG" in "DATA MONITOR" and check steering angle sensor signal.

Steering condition	STR ANGLE SIG (DATA MONITOR)
Driving straight	0±2.5 °
Turn 90 ° to left	Approx. +90 °
Turn 90 ° to right	Approx. –90 °

Is the inspection result normal?

YFS >> Inspection End NO

>> Replace steering angle sensor and adjust neutral position of steering angle sensor. Refer to BRC-238. "Removal and Installation".

Special Repair Requirement

${f 1}$. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEU-TRAL POSITION: Description".

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INFOID:0000000003937958

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C1143, C1144 STEERING ANGLE SENSOR

< COMPONENT DIAGNOSIS >

[TYPE 2]

$2. \hbox{\footnotesize calibration of decel g sensor}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1155 BRAKE FLUID LEVEL SWITCH

Description INFOID:0000000003937961

The brake fluid level switch converts the brake fluid level to an electric signal and transmits it to the ABS actuator and electric unit (control unit).

DTC Logic

DTC DETECTION LOGIC

	DTC	Display item	Malfunction detected condition	Possible cause	[
•	C1155	BR FLUID LEVEL LOW	Brake fluid level is low or communication line between the ABS actuator and electric unit (control unit) and brake fluid level switch is open or shorted.	Harness or connector Brake fluid level switch Brake fluid level	[

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
BR FLUID LEVEL LOW

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-191, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1. CONNECTOR INSPECTION

- 1. Disconnect ABS actuator and electric unit (control unit) connector and brake fluid level switch connector.
- 2. Check the terminals for deformation, disconnection, looseness or damage.

Is the inspection result normal?

YES >> GO TO 2

NO >> Repair or replace as necessary.

2.CHECK HARNESS BETWEEN BRAKE FLUID LEVEL SWITCH AND ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

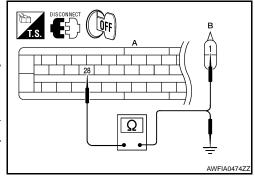
 Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 28 and brake fluid level switch connector E21 (B) terminal 1.

ABS actuator and electric unit (control unit)		Brake fluid level switch		Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	28	E21 (B)	1	Yes

2. Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 28 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity
Connector	Terminal		Continuity
E125 (A)	28	Ground	No

Is the inspection result normal?



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< COMPONENT DIAGNOSIS >

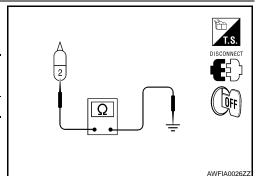
YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3. CHECK BRAKE FLUID LEVEL SWITCH GROUND

Check continuity between brake fluid level switch connector E21 terminal 2 and ground.

Brake fluid level switch		_	Continuity
Connector	Terminal		Continuity
E21	2	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace malfunctioning components.

f 4.CHECK BRAKE FLUID LEVEL SWITCH

Perform the brake fluid level switch component inspection. Refer to <u>BRC-192, "Component Inspection"</u>. <u>Is the inspection result normal?</u>

YES >> Perform self-diagnosis again. If the same results appear, replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace brake fluid level switch. Refer to <u>BR-47</u>, "<u>Disassembly and Assembly</u>".

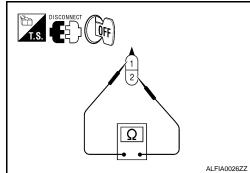
Component Inspection

INFOID:0000000003937964

1. CHECK BRAKE FLUID LEVEL SWITCH

- Turn ignition switch OFF.
- 2. Disconnect brake fluid level switch connector.
- 3. Check continuity between brake fluid level switch terminals.

Brake fluid level switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	When brake fluid is full in the reservoir tank.	No	
1 – 2	When brake fluid is empty in the reservoir tank.	Yes	



Is the inspection result normal?

YES >> Inspection End

NO >> Replace brake fluid level switch. Refer to <u>BR-47</u>, "<u>Disassembly and Assembly</u>".

Special Repair Requirement

INFOID:0000000003937965

${f 1}$.adjustment of steering angle sensor neutral position

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.CALIBRATION OF DECEL G SENSOR

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

C1156 ST ANG SEN COM CIR

Description INFOID:0000000003937966

The steering angle sensor is connected to the ABS actuator and electric unit (control unit) in addition to CAN lines. CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1156	ST ANG SEN COM CIR	When steering angle sensor is not transmitting CAN communication signal to the ABS actuator and electric unit (control unit).	 Harness or connector CAN communication line Steering angle sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
ST ANG SEN COM CIR	_

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-193</u>, "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1. CHECK CONNECTOR

- 1. Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector E125, check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- Reconnect connector and perform self-diagnosis.

Self-diagnosis results
CAN COMM CIRCUIT
ST ANG SEN COM CIR

Is above displayed on the self-diagnosis display?

YES >> Refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Inspection End

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C1160 DECEL G SEN SET

Description

The yaw rate/side/decel G sensor detects the yaw rate/side/decel G affecting the vehicle, and transmits the data to the ABS actuator and electric unit (control unit) as an analog voltage signal.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1160	DECEL G SEN SET	ABS decel G sensor adjustment is incomplete.	Decel G sensor calibration Yaw rate/side/decel G sensor ABS actuator and electric unit (control unit)

DTC CONFIRMATION PROCEDURE

CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results	
DECEL G SEN SET	

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-194, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000003937971

INSPECTION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

Self-diagnosis results	
DECEL G SEN SET	

Do self-diagnosis results indicate anything other than shown above?

YES >> Perform repair or replacement for the item indicated.

NO >> Perform calibration of decel G sensor. Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR : Description". GO TO 2

2.PERFORM SELF-DIAGNOSIS AGAIN

- 1. Turn the ignition switch to OFF and then to ON and erase self-diagnosis results.
- 2. Perform ABS actuator and electric unit (control unit) self-diagnosis again.

Are any self-diagnosis results displayed?

YES >> Replace yaw rate/side/decel G sensor. Refer to <u>BRC-239</u>, "Removal and Installation".

NO >> Inspection End

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C1163 ST ANGLE SEN SAFE

Description

The steering angle sensor detects the rotation amount, angular velocity and direction of the steering wheel, and transmits the data to the ABS actuator and electric unit (control unit) via CAN communication.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
C1163	ST ANGL SEN SAFE	When steering angle sensor is in safe mode.	Adjust steering angle sensor neutral position

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
ST ANGL SEN SAFE

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to <u>BRC-195</u>. "<u>Diagnosis Procedure</u>".

NO >> Inspection End

Diagnosis Procedure

INSPECTION PROCEDURE

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Adjust steering angle sensor neutral position. Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE <u>SENSOR NEUTRAL POSITION</u>: <u>Description</u>".

>> GO TO 2

2. INDICATOR LAMP CHECK

Check that VDC OFF indicator lamp is off.

Is VDC OFF indicator lamp off?

YES >> Inspection End

NO

>> Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-153, "CON-SULT-III Function (ABS)"</u>.

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C1164, C1165, C1166, C1167 CV/SV SYSTEM

Description INFOID:000000003937975

CV1, CV2 (CUT VALVE)

The cut valve shuts off the normal brake fluid path from the master cylinder, when VDC/TCS is activated.

SV1, SV2 (SUCTION VALVE)

The suction valve supplies the brake fluid from the master cylinder to the pump, when VDC/TCS is activated.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause	
C1164	CV1	VDC switch-over solenoid valve (CV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.		
C1165	CV2	VDC switch-over solenoid valve (CV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	Harness or connector APS actuator and electric unit	
C1166	SV1	VDC switch-over solenoid valve (SV1) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.	 ABS actuator and electric uni (control unit) 	
C1167	SV2	VDC switch-over solenoid valve (SV2) on the primary side is open circuit or shorted, or the control line is open or shorted to the power supply or the ground.		

DTC CONFIRMATION PROCEDURE

1. CHECK SELF-DIAGNOSIS RESULTS

Check the self-diagnosis results.

Self-diagnosis results
CV1
CV2
SV1
SV2

Is above displayed on the self-diagnosis display?

YES >> Proceed to diagnosis procedure. Refer to BRC-196, "Diagnosis Procedure".

NO >> Inspection End

Diagnosis Procedure

INFOID:0000000004422070

1. CHECK CONNECTOR

- Turn ignition switch OFF.
- 2. Disconnect ABS actuator and electric unit (control unit) connector.
- Check terminal for deformation, disconnection, looseness, and so on. If any malfunction is found, repair or replace terminal.
- 4. Reconnect connectors and then perform the self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

Is any item indicated on the self-diagnosis display?

YES >> GO TO 2

NO >> Poor connection of connector terminal. Repair or replace connector.

2.CHECK SOLENOID, VDC SWITCH-OVER VALVE AND ACTUATOR RELAY POWER SUPPLY CIRCUIT

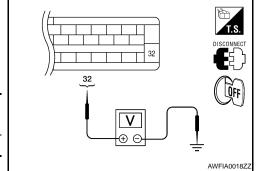
C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

Turn ignition switch OFF.

- 2. Disconnect ABS actuator and electric unit (control unit) connec-
- 3. Check voltage between ABS actuator and electric unit (control unit) harness connector E125 terminal 32 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Voltage
Connector	Terminal		voltage
E125	32	Ground	Battery voltage



Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.check solenoid, vdc switch-over valve and acuator relay ground circuit

Check continuity between ABS actuator and electric unit (control unit) harness connector E125 terminals 16, 47 and ground.

ABS actuator and ele	ectric unit (control unit)	_	Continuity	
Connector	Terminal		Continuity	
E125	16, 47	Ground	Yes	

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Repair or replace malfunctioning components.

16, 47 AWFIA0016Z

Component Inspection

1. CHECK ACTIVE TEST

- Select each test menu item on "ACTIVE TEST".
- On the display, touch "Up", "ACT UP", and "ACT KEEP", and check that the system operates as shown in the table below.

Operation		ABS solenoid valve (ACT)		
Орега	IIOH	Up	ACT UP	ACT KEEP
	FR RH IN SOL	Off	Off	Off
ED DIL ADS SOLENOID (ACT)	FR RH OUT SOL	Off	Off	Off
FR RH ABS SOLENOID (ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	FR LH IN SOL	Off	Off	Off
ED LLI ADO COLENOID (ACT)	FR LH OUT SOL	Off	Off	Off
FR LH ABS SOLENOID (ACT)	CV1	Off	On	On
	SV1	Off	On*	Off
	RR RH IN SOL	Off	Off	Off
DD DU ADO COLENOID (ACT)	RR RH OUT SOL	Off	Off	Off
RR RH ABS SOLENOID (ACT)	CV2	Off	On	On
	SV2	Off	On*	Off
	RR LH IN SOL	Off	Off	Off
RR LH ABS SOLENOID (ACT)	RR LH OUT SOL	Off	Off	Off
	CV2	Off	On	On
	SV2	Off	On*	Off
REAR SOL	This item is not used for the	This item is not used for this model.		

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INFOID:0000000003937978

[TYPE 2]

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C1164, C1165, C1166, C1167 CV/SV SYSTEM

< COMPONENT DIAGNOSIS >

[TYPE 2]

*: On for 1 to 2 seconds after the touch, and then Off

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-196, "Diagnosis Procedure".

Special Repair Requirement

INFOID:0000000003937979

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

$2. \hbox{\footnotesize calibration of decel g sensor}$

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-142</u>, "CALIBRATION OF <u>DECEL G SENSOR</u>: <u>Description</u>".

>> END

U1000 CAN COMM CIRCUIT

Description

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

DTC Logic

DTC DETECTION LOGIC

DTC	Display item	Malfunction detected condition	Possible cause
U1000	CAN COMM CIRCUIT	When ABS actuator and electric unit (control unit) is not transmitting or receiving CAN communication signal for 2 seconds or more.	

Diagnosis Procedure

INFOID:0000000003937988

INFOID:0000000003937989

INSPECTION PROCEDURE

1. CHECK CONNECTOR

1. Turn ignition switch OFF, disconnect the ABS actuator and electric unit (control unit) connector, and check the terminals for deformation, disconnection, looseness, and so on. If there is a malfunction, repair or replace the terminal.

2. Reconnect connector and perform self-diagnosis.

Is "CAN COMM CIRCUIT" displayed in self-diagnosis display items?

YES >> Print out the self-diagnostic results, and refer to LAN-14, "Trouble Diagnosis Flow Chart".

NO >> Connector terminal is loose, damaged, open, or shorted.

Special Repair Requirement

1. ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION

Always perform neutral position adjustment for the steering angle sensor when replacing the ABS actuator and electric unit (control unit). Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Description".

>> GO TO 2

2.calibration of decel ${\sf g}$ sensor

Always perform calibration of decel G sensor when replacing the ABS actuator and electric unit (control unit). Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Description".

>> END

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VDC OFF SWITCH

Description INFOID:0000000003937990

VDC OFF switch can deactivate (turn OFF) the VDC/TCS function by pressing the VDC OFF switch.

Component Function Check

INFOID:0000000003937991

1. CHECK VDC OFF SWITCH OPERATION

Turn ON/OFF the VDC OFF switch and check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly.

Condition	VDC OFF indicator lamp illumination status
VDC OFF switch: ON	ON
VDC OFF switch: OFF	OFF

Is the inspection result normal?

YES >> Inspection End

>> Go to diagnosis procedure. Refer to BRC-200, "Diagnosis Procedure". NO

Diagnosis Procedure

INFOID:0000000003937992

CHECK VDC OFF SWITCH

Perform the VDC OFF switch component inspection. Refer to BRC-201, "Component Inspection".

Is the inspection result normal?

YES >> GO TO 2

NO >> Replace VDC OFF switch.

2.CHECK VDC OFF SWITCH HARNESS

- 1. Disconnect ABS actuator and electric unit (control unit) connec-
- Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and VDC OFF switch connector M154 (B) terminal 1.

	and electric unit ol unit)	VDC OFF switch		Continuity
Connector	Terminal	Connector	Terminal	
E125 (A)	6	M154 (B)	1	Yes

Check continuity between ABS actuator and electric unit (control unit) connector E125 (A) terminal 6 and ground.

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ABS actuator and ele	ectric unit (control unit)		Continuity
Connector	Terminal		
E125 (A)	6	Ground	No

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace harness.

3.CHECK VDC OFF SWITCH GROUND

VDC OFF SWITCH

< COMPONENT DIAGNOSIS >

[TYPE 2]

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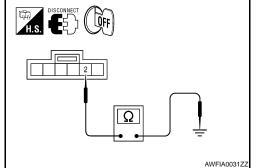
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Check continuity between VDC OFF switch connector M154 terminal 2 and ground.

VDC OF	F switch	_	Continuity
Connector	Terminal	_	Continuity
M154	2	Ground	Yes



Is the inspection result normal?

YES >> GO TO 4

NO >> Repair or replace harness.

4. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

<u>Is the inspection result normal?</u>

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

Component Inspection

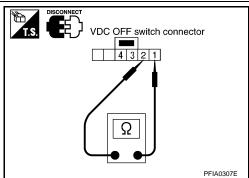
INFOID:0000000003937993

INSPECTION PROCEDURE

1. CHECK VDC OFF SWITCH

- 1. Turn ignition switch OFF.
- 2. Disconnect VDC OFF switch connector.
- Check continuity between VDC OFF switch terminals.

VDC OFF switch	Condition	Continuity	
Terminal	Condition	Continuity	
1 – 2	When VDC OFF switch is pressed.	Yes	
1 – 2	When VDC OFF switch is released.	No	



Is the inspection result normal?

YES >> Inspection End

NO >> Replace VDC OFF switch.

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ABS WARNING LAMP

Description

×: ON -: OFF

Condition	ABS warning lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003937995

1. CHECK ABS WARNING LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-202, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003937996

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-153</u>. "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

BRAKE WARNING LAMP

Description INFOID:000000003937997

×: ON –: OFF

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Condition	Brake warning lamp (Note 1)
Ignition switch OFF	-
Ignition switch ON	× (Note 2)
EBD function is malfunctioning.	×

NOTE:

- 1: Brake warning lamp will turn on in case of parking brake operation (when switch is ON) or of brake fluid level switch operation (when brake fluid is insufficient).
- 2: After starting engine, brake warning lamp is turned off.

Component Function Check

INFOID:0000000003937998

1.BRAKE WARNING LAMP OPERATION CHECK

Check that the lamp illuminates after the ignition switch is turned ON, and turns OFF after the engine is started.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-203, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003937999

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

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VDC OFF INDICATOR LAMP

Description INFOID:000000003938000

×: ON -: OFF

Condition	VDC OFF indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
VDC OFF switch turned ON. (VDC function is OFF.)	×
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003938001

1.VDC OFF INDICATOR LAMP OPERATION CHECK 1

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> GO TO 2

NO >> Go to diagnosis procedure. Refer to BRC-204, "Diagnosis Procedure".

2.VDC OFF INDICATOR LAMP OPERATION CHECK 2

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> Inspection End

NO >> Check VDC OFF switch. Refer to BRC-200, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003938002

1. CHECK VDC OFF SWITCH

Check that the VDC OFF indicator lamp in the combination meter turns ON/OFF correctly when operating the VDC OFF switch.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check VDC OFF switch. Refer to <u>BRC-200</u>, "<u>Diagnosis Procedure</u>".

2. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 3

NO >> Check items displayed by self-diagnosis.

3.CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236, "Removal and Installation".

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

SLIP INDICATOR LAMP

Description

×: ON –: OFF

Condition	SLIP indicator lamp
Ignition switch OFF	-
For 2 seconds after turning ON ignition switch	×
2 seconds later after turning ON ignition switch	-
VDC/TCS function is malfunctioning.	×
ABS function is malfunctioning.	×
EBD function is malfunctioning.	×

Component Function Check

INFOID:0000000003938004

1. CHECK SLIP INDICATOR LAMP OPERATION

Check that the lamp illuminates for approximately 2 seconds after the ignition switch is turned ON.

Is the inspection result normal?

YES >> Inspection End

NO >> Go to diagnosis procedure. Refer to BRC-205, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000003938005

1. CHECK SELF-DIAGNOSIS

Perform ABS actuator and electric unit (control unit) self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

Is the inspection result normal?

YES >> GO TO 2

NO >> Check items displayed by self-diagnosis.

2. CHECK COMBINATION METER

Check if the indication and operation of combination meter are normal. Refer to MWI-23, "Diagnosis Description".

Is the inspection result normal?

YES >> Replace ABS actuator and electric unit (control unit). Refer to <u>BRC-236, "Removal and Installation".</u>

NO >> Replace combination meter. Refer to MWI-94, "Removal and Installation".

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APPLICATION NOTICE

< ECU DIAGNOSIS > [TYPE 2]

ECU DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks
TYPE 1	VDC/TCS/ABS
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS

INFOID:0000000003938006

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 2]

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

Reference Value

В

Positive value

(m/s²)

VALUES ON THE DIAGNOSIS TOOL

CAUTION:

The display shows the control unit calculation data, so a normal value might be displayed even in the event the output circuit (harness) is open or short-circuited.

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
		0 [km/h (MPH)]	Vehicle stopped
R LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
R RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
R LH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
		0 [km/h (MPH)]	Vehicle stopped
RR RH SENSOR	Wheel speed	Nearly matches the speed meter display (± 10% or less)	Vehicle running (Note 1)
STOP LAMP SW	Stop lamp switch signal status	When brake pedal is depressed	ON
TOP LAMP SW		When brake pedal is released	OFF
ATTERY VOLT	Battery voltage supplied to the ABS actuator and electric unit (control unit)	Ignition switch ON	10 – 16 V
GEAR	Gear position determined by TCM	1st gear 2nd gear 3rd gear 4th gear 5th gear	1 2 3 4 5
SLCT LVR POSI	A/T selector lever position	P position R position N position D position	P R N D
NEE OW	VDC OFF switch ON/OFF	VDC OFF switch ON (When VDC OFF indicator lamp is ON)	ON
OFF SW		VDC OFF switch OFF (When VDC OFF indicator lamp is OFF)	OFF
ANA DATE OFN	Yaw rate detected by yaw rate/side/decel G	When vehicle is stopped	Approx. 0 d/s
AW RATE SEN	sensor	When vehicle turning	-75 to 75 d/s
CCEL POS SIG	Throttle actuator opening/closing is displayed (linked with accelerator pedal)	Accelerator pedal not depressed (ignition switch is ON)	0 %
OUEL FUS SIG		Accelerator pedal depressed (ignition switch is ON)	0 - 100 %
		Vehicle stopped	Approx. 0 m/s ²
SIDE G-SENSOR	Transverse G detected by side G sensor	Vehicle turning right	Negative value (m/s ²)

Vehicle turning left

< ECU DIAGNOSIS > [TYPE 2]

	Display content	Data monitor		
Monitor item		Condition	Reference value in normal operation	
STR ANGLE SIG	Steering angle detected by steering angle	Straight-ahead	Approx. 0±2.5°	
STR ANGLE SIG	sensor	Steering wheel turned	−720 to +720°	
PRESS SENSOR	Not applied but displayed	_	_	
		With engine stopped	0 rpm	
ENGINE SPEED	With engine running	Engine running	Almost in accordance with tachometer display	
FLUID LEV SW	Brake fluid level switch signal status	When brake fluid level switch ON	ON	
FLOID LEV 3W	Brake fluid level switch signal status	When brake fluid level switch OFF	OFF	
FR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
TRIATIN SOL	Operation status of each soleriold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
FR RH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED LILIN COL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
ED LILOUT COL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
FR LH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
RR RH IN SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
RR RH OUT SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	
	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON	
RR LH IN SOL		When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 2]

		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
RR LH OUT SOL	Operation status of each solenoid valve	Actuator (solenoid valve) is active ("AC-TIVE TEST" with CONSULT-III) or actuator relay is inactive (in fail-safe mode)	ON
KK EITOOT SOE	Operation status of each solehold valve	When the actuator (solenoid valve) is not active and actuator relay is active (ignition switch ON)	OFF
MOTOR RELAY	Motor and motor relay operation	When the motor relay and motor are operating	ON
WIOTOR RELEAT	Motor and motor rolay operation	When the motor relay and motor are not operating	OFF
ACTUATOR RLY	Actuator rolay operation	When the actuator relay is operating	ON
ACTUATOR REI	Actuator relay operation	When the actuator relay is not operating	OFF
ABS WARN LAMP	ABS warning lamp	When ABS warning lamp is ON	ON
ADO WAKIN LAIVIP	(Note 2)	When ABS warning lamp is OFF	OFF
OFF LAMP	VDC OFF indicator lamp	When VDC OFF indicator lamp is ON	ON
OFF LAMP	(Note 2)	When VDC OFF indicator lamp is OFF	OFF
CLID LAMD	SLIP indicator lamp	When SLIP indicator lamp is ON	ON
SLIP LAMP	(Note 2)	When SLIP indicator lamp is OFF	OFF
EDD CIONAL	EDD	EBD is active	ON
EBD SIGNAL	EBD operation	EBD is inactive	OFF
ADC CICALAL	ADOti	ABS is active	ON
ABS SIGNAL	ABS operation	ABS is inactive	OFF
TCS SIGNAL	TCS energian	TCS is active	ON
TCS SIGNAL	TCS operation	TCS is inactive	OFF
VDC CICNAL	VDC on oration	VDC is active	ON
VDC SIGNAL	VDC operation	VDC is inactive	OFF
	CDD fail acts signal	In EBD fail-safe	ON
EBD FAIL SIG	EBD fail-safe signal	EBD is normal	OFF
ADC FAIL OLO	ADC fail acfo cional	In ABS fail-safe	ON
ABS FAIL SIG	ABS fail-safe signal	ABS is normal	OFF
TOO EALL OLO	TCS fail aufo signal	In TCS fail-safe	ON
TCS FAIL SIG	TCS fail-safe signal	TCS is normal	OFF
VDC EATL SIC	VDC fail safe signal	In VDC fail-safe	ON
VDC FAIL SIG	VDC fail-safe signal	VDC is normal	OFF
	Crank aparation	Crank is active	ON
CRANKING SIG	Crank operation	Crank is inactive	OFF
CV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

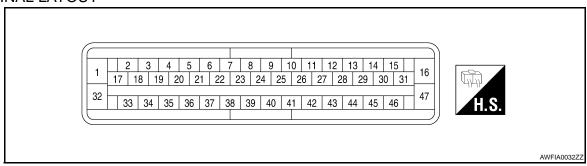
< ECU DIAGNOSIS > [TYPE 2]

-		Data monitor	
Monitor item	Display content	Condition	Reference value in normal operation
CV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV1	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
SV2	VDC switch-over valve	When actuator (switch-over valve) is active ("ACTIVE TEST" with CONSULT-III) or actuator relay is inactive (when in fail-safe mode)	ON
		When actuator (switch-over valve) is not active and actuator relay is active (ignition switch ON)	OFF
DECEL G-SEN	Longitudinal acceleration detected by Decel	Vehicle stopped	Approx. 0 G
DECEL G-SEN	G-Sensor	Vehicle running	-1.7 to 1.7 G
EBD WARN LAMP	EBD warning lamp	When EBD warning lamp is ON	ON
LDD WAINI LAWF	(Note 3)	When EBD warning lamp is OFF	OFF
N POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = N position	ON
111 001 010	1 W Switch signal City Ci 1 Condition	A/T shift position = other than N position	OFF
P POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = P position	ON
1 1 001 010	1 W Switch signal City Ci 1 Condition	A/T shift position = other than P position	OFF
R POSI SIG	PNP switch signal ON/OFF condition	A/T shift position = R position	ON
	THE SWILLING SIGNAL CHAPTER CONTRIBUTE	A/T shift position = other than R position	OFF
2WD/4WD	Drive axle	2WD model	2WD
	Sitte date	4WD model	4WD

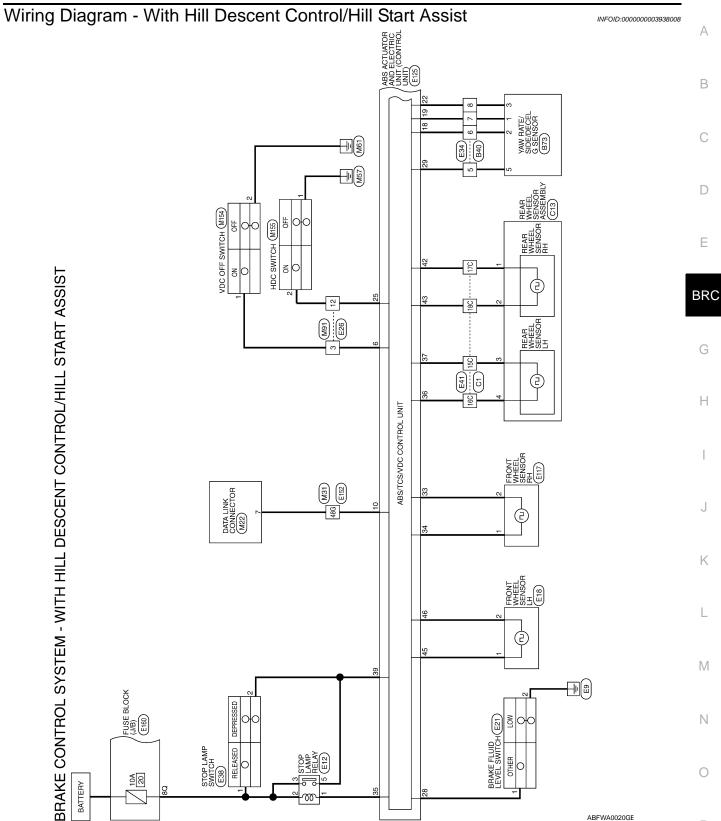
NOTE:

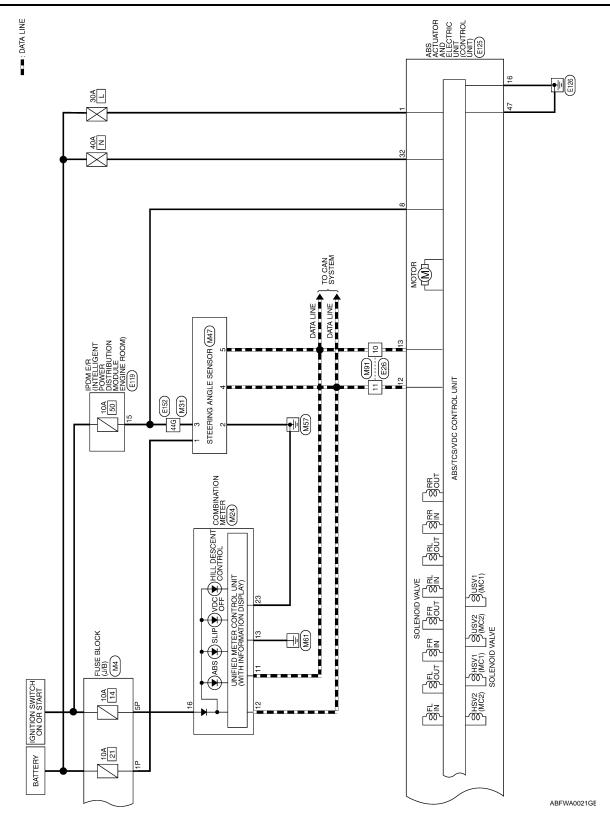
- 1: Confirm tire pressure is normal.
- 2: On and off timing for warning lamp and indicator lamp.
- ABS warning lamp: Refer to BRC-202, "Description".
- Brake warning lamp: Refer to BRC-203, "Description".
- VDC OFF indicator lamp: Refer to BRC-204, "Description".
- SLIP indicator lamp: Refer to BRC-205, "Description".

TERMINAL LAYOUT



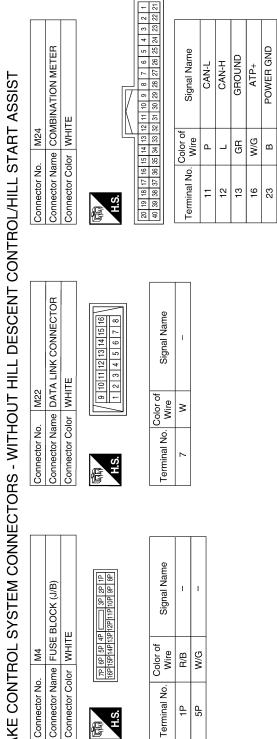
< ECU DIAGNOSIS > [TYPE 2]





[TYPE 2] < ECU DIAGNOSIS >

BRAKE CONTROL SYSTEM CONNECTORS - WITHOUT HILL DESCENT CONTROL/HILL START ASSIST



	Terminal No. Color of Signal Name Connector No.	44G W/R - Connector Color WHTF	48G W –									
--	---	--------------------------------	---------	--	--	--	--	--	--	--	--	--

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	Connector No.	. No. M155		
Į,	Connector	· Name HILL DES	Connector Name HILL DESCENT CONTROL SWITCH	
	Connector	Connector Color WHITE	且	
	原 H.S.	8 6 1	2	
Name	Terminal No	_	Signal Name	
		Wire		
	-	В	ı	
	α	>	1	

Signal Name	_	ı	
Color of Wire	В	Υ	
Terminal No.	1	2	



o. E21	ame BRAKE FLUID LEVEL SWITCH	olor GRAY	4 -10	Color of Signal Name Wire	SB –	
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	-	

Connector No.	M154	
Connector Name	ume VDC (VDC OFF SWITCH
Connector Color	olor GRAY	
原动 H.S.	6 6 6	3 2 1
Terminal No.	Color of Wire	Signal Name
1	GR	I
2	В	I

Connector No.	. E18	
Connector Name	me FRON	FRONT WHEEL SENSOR LH
Connector Color GRAY	lor GRAY	
H.S.	1	
Terminal No.	Color of Wire	Signal Name
1	9	ı
٥	а	ı

Connector No.). M91	
Connector Name WIRE TO WIRE	ame WIF	RE TO WIRE
Connector Color	olor WHITE	<u>=</u>
H.S.	7 6 5 4	6 5 4
Terminal No.	Color of Wire	Signal Name
ဇ	GR	I
10	۵	ı
11	١	-
12	>	=

E12	Connector Name STOP LAMP RELAY	BLUE	
Connector No.	Connector Name	Connector Color	

Sonnector Name STOP LAMP RELAY	olor BLUE	2 2 2 2	fo rolo
Connector Na	Connector Color BLUE	H.S.	



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ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

[TYPE 2] < ECU DIAGNOSIS >

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Connector No. E38 Connector Name STOP LAMP SWITCH Connector Color WHITE	Terminal No. Color of Signal Name 1 R/B	A B C D
Connector No. E34 Connector Name WIRE TO WIRE Connector Color WHITE # 3 2 1 # 3 2 1	Terminal No. Color of Signal Name 5 BR	BRC G H
Connector No.	Terminal No. Wire Signal Name 3 GR -	K L M N

BRC-215

Signal Name	CLUS GND	ı	1	KL30 V	FR-RH SIG	FR-RH PWR	STOP LAMP SW ON	RR-LH PWR	RR-LH SIG	1	STOP LAMP SW	I	-	RR-RH SIG	RR-RH PWR	-	FR-LH PWR	FR-LH SIG	GND P
Color of Wire	BR	1	-	>	×	В	>	_	۵	-	SB	ı	_	۸	ГG	_	g	В	В
Terminal No.	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47

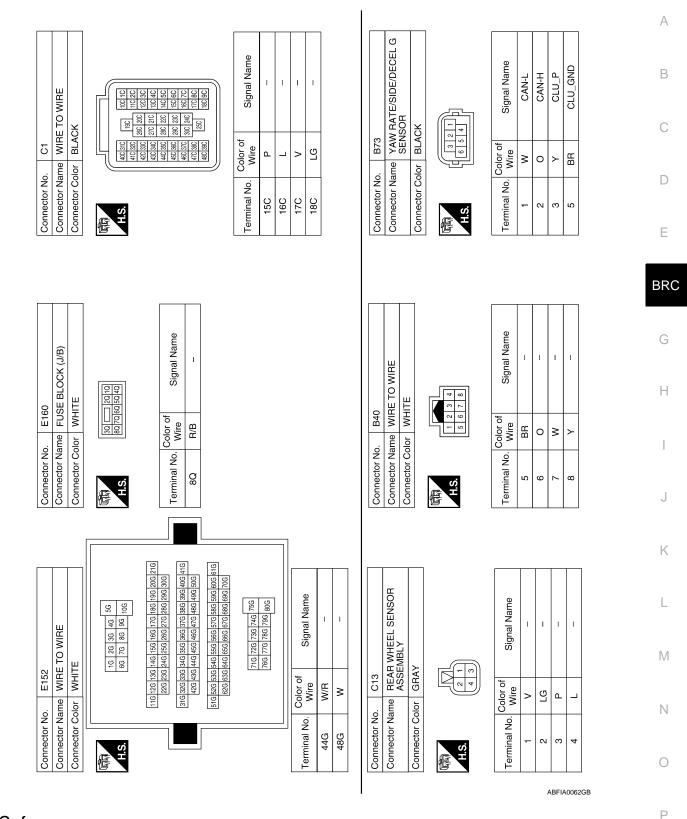
	30,0100	
Terminal No.	Wire	Signal Name
1	ш	KL30-P
2	-	ı
3	-	1
4	1	ı
5	ı	ı
9	GR	VDC OFF SW
7	ı	ı
8	W/R	NSI
6	1	1
10	SB	DIAG K
11	ı	1
12	٦	CAN-H
13	d	CAN-L
14	-	_
15	_	-
16	В	GND V
17	ı	1
18	0	CAN2-H
19	Μ	CAN2-L
20	-	_
21	1	-
22	Y	CLUS SP
23	_	_
24	_	1
25	>	HDC ON
26	I	ı
27	ı	ı
28	GR	BRAKE LEVEL SW

Connector No.	E125
Connector Name	Connector Name ELECTRIC UNIT (CONTROL UNIT) (WITH VQ40DE)
Connector Color BLACK	BLACK



ABFIA0061GB

< ECU DIAGNOSIS > [TYPE 2]



Fail-Safe

CAUTION:

If the Fail-Safe function is activated, perform Self Diagnosis for ABS/TCS/VDC system.

ABS/EBD SYSTEM

INFOID:0000000003938009

< ECU DIAGNOSIS > [TYPE 2]

In case of an electrical malfunction with the ABS, the ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on. In case of an electrical malfunction with the EBD system, the BRAKE warning lamp, ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp will turn on.

The system will revert to one of the following conditions of the Fail-Safe function.

- 1. For ABS malfunction, only the EBD is operative and the condition of the vehicle is the same condition of vehicles without ABS/TCS/VDC system.
- For EBD malfunction, the EBD and ABS become inoperative, and the condition of the vehicle is the same as the condition of vehicles without ABS/TCS/VDC or EBD system.

VDC/TCS SYSTEM

In case of TCS/VDC system malfunction, the VDC OFF indicator lamp and SLIP indicator lamp are turned on and the condition of the vehicle is the same as the condition of vehicles without TCS/VDC system. In case of an electrical malfunction with the TCS/VDC system, the ABS control continues to operate normally without TCS/VDC control.

DTC No. Index

DTC	Items (CONSULT screen terms)	Reference	
C1101	RR RH SENSOR-1	DDC 450 IID contintion II	
C1102	RR LH SENSOR-1		
C1103	FR RH SENSOR-1	BRC-159, "Description"	
C1104	FR LH SENSOR-1		
C1105	RR RH SENSOR-2		
C1106	RR LH SENSOR-2		
C1107	FR RH SENSOR-2	BRC-162, "Description"	
C1108	FR LH SENSOR-2		
C1109	BATTERY VOLTAGE [ABNORMAL]	BRC-165, "Description"	
C1110	CONTROLLER FAILURE	BRC-167, "DTC Logic"	
C1111	PUMP MOTOR	BRC-168, "Description"	
C1113	G-SENSOR	BRC-170, "Description"	
C1115	ABS SENSOR [ABNORMAL SIGNAL]	BRC-173, "Description"	
C1116	STOP LAMP SW	BRC-176, "Description"	
C1120	FR LH IN ABS SOL	BRC-178, "Description"	
C1121	FR LH OUT ABS SOL	BRC-181, "Description"	
C1122	FR RH IN ABS SOL	BRC-178, "Description"	
C1123	FR RH OUT ABS SOL	BRC-181, "Description"	
C1124	RR LH IN ABS SOL	BRC-178, "Description"	
C1125	RR LH OUT ABS SOL	BRC-181, "Description"	
C1126	RR RH IN ABS SOL	BRC-178, "Description"	
C1127	RR RH OUT ABS SOL	BRC-181, "Description"	
C1130	ENGINE SIGNAL 1	· · ·	
C1131	ENGINE SIGNAL 2		
C1132	ENGINE SIGNAL 3	BRC-184, "Description"	
C1133	ENGINE SIGNAL 4		
C1136	ENGINE SIGNAL 6		
C1140	ACTUATOR RLY	BRC-186, "Description"	
C1143	ST ANG SEN CIRCUIT	DDC 400 "D tot"	
C1144	ST ANG SEN SIGNAL	BRC-188, "Description"	

ABS ACTUATOR AND ELECTRIC UNIT (CONTROL UNIT)

< ECU DIAGNOSIS > [TYPE 2]

DTC	Items (CONSULT screen terms)	Reference	
C1145	YAW RATE SENSOR	PDC 170 "Description"	
C1146	SIDE G-SEN CIRCUIT	BRC-170, "Description"	
C1155	BR FLUID LEVEL LOW	BRC-191, "Description"	
C1156	ST ANG SEN COM CIR	BRC-193, "Description"	
C1160	DECEL G SEN SET	BRC-194, "Description"	
C1163	ST ANGL SEN SAFE	BRC-195, "Description"	
C1164	CV1		
C1165	CV2	PDC 106 "Description"	
C1166	SV1	BRC-196, "Description"	
C1167	SV2		
C1170	VARIANT CODING	BRC-167, "DTC Logic"	
U1000	CAN COMM CIRCUIT	BRC-199, "Description"	

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SYMPTOM DIAGNOSIS

APPLICATION NOTICE

Application Notice

Service information	Remarks	
TYPE 1	VDC/TCS/ABS	
TYPE 2	HILL DESCENT CONTROL/HILL START ASSIST/VDC/TCS/ABS	

VDC/TCS/ABS

Symptom Table

If ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp turn ON, perform self-diagnosis.

Symptom	Check item	Reference
Excessive ABS function operation frequency	Brake force distribution	
	Looseness of front and rear axle	BRC-222, "Diag- nosis Procedure"
	Wheel sensor and rotor system	
Unexpected pedal reaction	Brake pedal stroke	BRC-223, "Diag-
	Make sure the braking force is sufficient when the ABS is not operating.	nosis Procedure"
The braking distance is long	Check stopping distance when the ABS is not operating.	BRC-224, "Diag- nosis Procedure"
ABS function does not operate (Note 1)	ABS actuator and electric unit (control unit)	BRC-225, "Diag- nosis Procedure"
Pedal vibration or ABS operation sound occurs (Note 2)	Brake pedal	BRC-226, "Diag-
	ABS actuator and electric unit (control unit)	nosis Procedure"
Vehicle jerks during VDC/TCS/ABS control	ABS actuator and electric unit (control unit)	
	TCM	BRC-227, "Diag- nosis Procedure"
	ECM	

NOTE:

- 1: The ABS does not operate when the speed is 10 km/h (6 MPH) or less.
- 2: Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.
- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

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[TYPE 2]

EXCESSIVE ABS FUNCTION OPERATION FREQUENCY

Diagnosis Procedure

INFOID:0000000003938013

1. CHECK START

Check front and rear brake force distribution using a brake tester.

Is the inspection result normal?

YES >> GO TO 2

NO >> Check brake system.

2.CHECK FRONT AND REAR AXLE

Make sure that there is no excessive play in the front and rear axles. Refer to front: <u>FAX-5</u>, "<u>On-Vehicle Inspection and Service</u>", Rear: <u>RAX-5</u>, "<u>On-Vehicle Inspection and Service</u>".

Is the inspection result normal?

YES >> GO TO 3

NO >> Repair or replace malfunctioning components.

3.CHECK WHEEL SENSOR AND SENSOR ROTOR

Check the following.

- · Wheel sensor installation for damage.
- Sensor rotor installation for damage.
- Wheel sensor connector connection.
- · Wheel sensor harness inspection.

Is the inspection result normal?

YES >> GO TO 4

NO

- >> Replace wheel sensor or sensor rotor. Refer to <u>BRC-234</u>, "Removal and Installation" (wheel sensor) or <u>BRC-235</u>, "Removal and Installation" (sensor rotor).
 - Repair harness.

4. CHECK ABS WARNING LAMP DISPLAY

Make sure that the ABS warning lamp is turned off after the ignition switch is turned ON or when driving. Is the ABS warning lamp illuminated?

YES >> Perform self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

NO >> Normal

UNEXPECTED PEDAL REACTION

Diagnosis Procedure

1. CHECK BRAKE PEDAL STROKE

Check brake pedal stroke. Refer to <u>BR-17</u>, "Inspection and Adjustment - Standard Pedal" or <u>BR-18</u>, "Inspection and Adjustment - Adjustable Pedal".

Is the stroke too large?

YES

- >> Bleed air from brake tube and hose. Refer to BR-20, "Bleeding Brake System".
 - Check brake pedal, brake booster, and master cylinder for mount play, looseness, brake system fluid leakage, etc. Refer to <u>BR-17</u>, "<u>Inspection and Adjustment Standard Pedal</u>" or <u>BR-18</u>, "<u>Inspection and Adjustment Adjustable Pedal</u>" (brake pedal), <u>BR-32</u>, "<u>Removal and Installation</u>" (master cylinder), <u>BR-10</u>, "<u>Inspection</u>" (brake booster).

NO >> GO TO 2

2. CHECK FUNCTION

Disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. Check if braking force is normal in this condition. Connect connector after inspection.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

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THE BRAKING DISTANCE IS LONG

< SYMPTOM DIAGNOSIS >

 $\mathbf{S} > \mathbf{TYPE 2}$

THE BRAKING DISTANCE IS LONG

Diagnosis Procedure

INFOID:0000000003938015

CAUTION:

The stopping distance on slippery road surfaces might be longer with the ABS operating than when the ABS is not operating.

1. CHECK FUNCTION

Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector to deactivate ABS. In this condition, check stopping distance. After inspection, connect connector.

Is the inspection result normal?

YES >> Normal

NO >> Check brake system.

ABS FUNCTION DOES NOT OPERATE

[TYPE 2] < SYMPTOM DIAGNOSIS > ABS FUNCTION DOES NOT OPERATE Α Diagnosis Procedure INFOID:0000000003938016 **CAUTION:** В ABS does not operate when speed is 10 km/h (6 MPH) or lower. 1. CHECK ABS WARNING LAMP DISPLAY C Make sure that the ABS warning lamp turns OFF after ignition switch is turned ON or when driving. Is the inspection result normal? YES >> Normal D NO >> Perform self-diagnosis. Refer to BRC-153, "CONSULT-III Function (ABS)". Е

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[TYPE 2]

INFOID:0000000003938017

PEDAL VIBRATION OR ABS OPERATION SOUND OCCURS

Diagnosis Procedure

CAUTION:

Under the following conditions, ABS is activated and vibration is felt when brake pedal is lightly depressed. However, this is normal.

- When shifting gears
- When driving on slippery road
- During cornering at high speed
- When passing over bumps or grooves [at approximately 50 mm (1.97 in) or more]
- When pulling away just after starting engine [at approximately 10 km/h (6 MPH) or higher]

1.SYMPTOM CHECK 1

Check that there are pedal vibrations when the engine is started.

Do vibrations occur?

YES >> GO TO 2

NO >> Inspect the brake pedal.

2.SYMPTOM CHECK 2

Check that there are ABS operation noises when the engine is started.

Do the operation noises occur?

YES >> GO TO 3

NO >> Perform self-diagnosis. Refer to <u>BRC-153</u>, "CONSULT-III Function (ABS)".

3.SYMPTOM CHECK 3

Check symptoms when electrical component (headlamps, etc.) switches are operated.

Do symptoms occur?

YES >> Check if there is a radio, antenna, antenna lead wire, or wiring close to the control unit. If there is, move it farther away.

NO >> Normal

VEHICLE JERKS DURING VDC/TCS/ABS CONTROL

[TYPE 2] < SYMPTOM DIAGNOSIS > VEHICLE JERKS DURING VDC/TCS/ABS CONTROL Α Diagnosis Procedure INFOID:0000000003938018 1.SYMPTOM CHECK В Check if the vehicle jerks during VDC/TCS/ABS control. Is the inspection result normal? YES >> Normal. NO >> GO TO 2 2.CHECK SELF-DIAGNOSIS RESULTS D Perform self-diagnosis of ABS actuator and electric unit (control unit). Refer to BRC-153, "CONSULT-III Function (ABS)". Are self-diagnosis results indicated? Е >> Check corresponding items, make repairs, and perform ABS actuator and electric unit (control unit) self-diagnosis. NO >> GO TO 3 BRC 3. CHECK CONNECTOR Turn ignition switch OFF and disconnect ABS actuator and electric unit (control unit) connector and check terminal for deformation, disconnection, looseness, etc. Securely connect connectors and perform ABS actuator and electric unit (control unit) self-diagnosis. Are self-diagnosis results indicated? Н YES >> If poor contact, damage, open or short circuit of connector terminal is found, repair or replace. NO >> GO TO 4 f 4 .CHECK ECM AND TCM SELF-DIAGNOSIS RESULTS Perform ECM and TCM self-diagnosis. Are self-diagnosis results indicated? YES >> Check the corresponding items. • ECM: Refer to EC-73, "CONSULT-III Function (ENGINE)". TCM: Refer to TM-36, "CONSULT-III Function (TRANSMISSION)". NO >> Replace ABS actuator and electric unit (control unit). Refer to BRC-236. "Removal and Installa-K tion". L M N Р

NORMAL OPERATING CONDITION

Description INFOID:000000003938019

Symptom	Result	
Slight vibrations are felt on the brake pedal and the operation noises occur, when VDC, TCS or ABS is activated.		
Stopping distance is longer than that of vehicles without ABS when the vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.	This is a normal condition due to the VDC, TCS or ABS activation.	
The brake pedal moves and generates noises, when TCS or VDC is activated due to rapid acceleration or sharp turn.	100 of Abo donvation.	
The brake pedal vibrates and motor operation noises occur from the engine room, after the engine starts and just after the vehicle starts.	This is normal, and it is caused by the ABS operation check.	
Depending on the road conditions, the driver may experience a sluggish feel.	This is normal, because	
TCS may activate momentarily if wheel speed changes when driving over location where friction coefficient varies, when downshifting, or when fully depressing accelerator pedal.	TCS places the highest priority on the optimum traction (stability).	
The ABS warning lamp, VDC OFF indicator lamp and SLIP indicator lamp may turn ON when the vehicle is subject to strong shaking or large vibration, such as when the vehicle is rotating on a turntable or located on a ship while the engine is running.	In this case, restart the engine on a normal road. If the normal condition is restored, there is no malfunction. At	
VDC may not operate normally or the ABS warning lamp, VDC OFF indicator lamp, and SLIP indicator lamp may illuminate, when running on a special road that is extremely slanted (e.g. bank in a circuit course).		
A malfunction may occur in the yaw rate/side/decel G sensor system, when the vehicle turns sharply, such as during a spin turn, axle turn, or drift driving, while the VDC function is off (VDC OFF indicator lamp illuminated).	that time, erase the self- diagnosis memory.	
The vehicle speed will not increase even though the accelerator pedal is depressed, when inspecting the speedometer on a 2-wheel chassis dynamometer.	Normal (Deactivate the VDC/TCS function before performing an inspection on a chassis dynamometer.)	
VDC OFF indicator lamp and SLIP indicator lamp may simultaneously turn on when low tire pressure warning lamp turns on.	This is not a VDC system error but results from characteristic change of tire.	

< PRECAUTION > [TYPE 2]

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal
 injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag
 Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

Precaution for Brake System

CAUTION:

- Refer to BR-20, "Drain and Refill" for recommended brake fluid.
- Never reuse drained brake fluid.
- Be careful not to splash brake fluid on painted areas; it may cause paint damage. If brake fluid is splashed on painted areas, wash it away with water immediately.
- To clean or wash all parts of master cylinder and disc brake caliper, use clean brake fluid.
- Never use mineral oils such as gasoline or kerosene. They will ruin rubber parts of the hydraulic system.
- Use flare nut wrench when removing and installing brake tube.
- If a brake fluid leak is found, the part must be disassembled without fail. Then it has to be replaced with a new one if a defect exists.
- Turn the ignition switch OFF and remove the connector of the ABS actuator and electric unit (control unit) or the battery terminal before performing the work.
- Always torque brake lines when installing.
- Burnish the brake contact surfaces after refinishing or replacing rotors, after replacing pads, or if a soft pedal occurs at very low mileage.

Refer to <u>BR-38, "Brake Burnishing"</u> (front disc brake) or <u>BR-43, "Brake Burnishing"</u> (rear disc brake).

WARNING:

Clean brake pads and shoes with a waste cloth, then wipe with a dust collector.

Precaution for Brake Control

- During ABS operation, the brake pedal may vibrate lightly and a mechanical noise may be heard. This is normal.
- Just after starting vehicle, the brake pedal may vibrate or a motor operating noise may be heard from engine compartment. This is a normal status of operation check.
- Stopping distance may be longer than that of vehicles without ABS when vehicle drives on rough, gravel, or snow-covered (fresh, deep snow) roads.

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Commercial service tool

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< PRECAUTION > [TYPE 2]

 When an error is indicated by ABS or another warning lamp, collect all necessary information from customer (what symptoms are present under what conditions) and check for simple causes before starting diagnosis. Besides electrical system inspection, check brake booster operation, brake fluid level, and fluid leaks.

- If incorrect tire sizes or types are installed on the vehicle or brake pads are not Genuine NISSAN parts, stopping distance or steering stability may deteriorate.
- If there is a radio, antenna or related wiring near control module, ABS function may have a malfunction or error.
- If aftermarket parts (car stereo, CD player, etc.) have been installed, check for incidents such as harness pinches, open circuits or improper wiring.
- If the following components are replaced with non-genuine components or modified, the VDC OFF indicator lamp and SLIP indicator lamp may turn on or the VDC system may not operate properly. Components related to suspension (shock absorbers, struts, springs, bushings, etc.), tires, wheels (exclude specified size), components related to brake system (pads, rotors, calipers, etc.), components related to engine (muffler, ECM, etc.), components related to body reinforcement (roll bar, tower bar, etc.).
- Driving with broken or excessively worn suspension components, tires or brake system components may cause the VDC OFF indicator lamp and the SLIP indicator lamp to turn on, and the VDC system may not operate properly.
- When the TCS or VDC is activated by sudden acceleration or sudden turn, some noise may occur. The noise is a result of the normal operation of the TCS and VDC.
- When driving on roads which have extreme slopes (such as mountainous roads) or high banks (such as sharp curves on a freeway), the VDC may not operate normally, or the VDC warning lamp and the SLIP indicator lamp may turn on. This is not a problem if normal operation can be resumed after restarting the engine.
- Sudden turns (such as spin turns, acceleration turns), drifting, etc. with VDC turned off may cause the yaw rate/side/decel G sensor to indicate a problem. This is not a problem if normal operation can be resumed after restarting the engine.
- If battery is removed or steering angle sensor is disconnected, power to steering angle sensor is lost and the screen goes into steering angle sensor safe mode.
- When screen goes into steering angle sensor safe mode, perform "Adjustment of Steering Angle Sensor Neutral Position" with CONSUT-III and check that VDC OFF indicator turns off. Additionally, perform self-diagnosis, check that only "Steering Angle Sensor Safe Mode" is shown for self-diagnostic result, and then delete the memory. (If the self-diagnostic result shows an indication other than "Steering Angle Sensor Safe Mode", repair the relevant part and restart self-diagnosis.) The steering angle sensor is released and returns to normal condition by performing the above operation.
- When checking, if only "Steering Angle Sensor Safe Mode" is shown in the self-diagnostic result and VDC OFF indicator is off, delete history of malfunction. This happens when battery power supply is lost and the screen goes into Steering Angle Sensor Safe Mode, and then screen returns to normal mode automatically by driving the vehicle in a straight forward direction [for approximately 30 seconds at 20 km/h (12 MPH) or more] after power is supplied again.

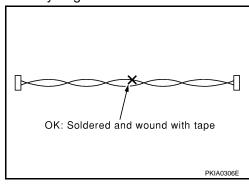
NOTE:

VDC OFF indicator lamp is on when VDC OFF switch is on.

Precaution for CAN System

INFOID:0000000003938023

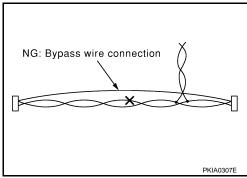
- Do not apply voltage of 7.0V or higher to terminal to be measured.
- Maximum open terminal voltage of tester in use must be less than 7.0V.
- Before checking harnesses, turn ignition switch OFF and disconnect battery negative cable.
- Area to be repaired must be soldered and wrapped with tape.
 Make sure that fraying of twisted wire is within 110 mm (4.33 in).



PRECAUTIONS

< PRECAUTION > [TYPE 2]

• Do not make a bypass connection to repaired area. (If the circuit is bypassed, characteristics of twisted wire will be lost.)



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< PREPARATION > [TYPE 2]

PREPARATION

PREPARATION

Special Service Tool

INFOID:0000000004427405

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name		Description
KV991J0080 (J-45741) ABS active wheel sensor tester	J-45741-BOX OPPOSITE SIMILION WFIA0101E	Checking operation of ABS active wheel sensors
ST30031000 (—) Bearing puller	ZZA0700D	Removing sensor rotor
ST30720000 (J-25405) Drift	a b ZZA0701D	Installing rear sensor rotor a: 77 mm (0.03 in) diameter b: 55 mm (2.17 in) diameter
ST27863000 (—) Drift	a b b b zzA0832D	Installing rear sensor rotor a: 75 mm (2.95 in) diameter b: 62 mm (2.44 in) diameter
KV40104710 (—) Drift	ZZA0832D	Installing rear sensor rotor a: 76 mm (2.99 in) diameter b: 68.5 mm (2.697 in) diameter

PREPARATION

< PREPARATION > [TYPE 2]

Commercial Service Tool

INFOID:0000000004427406

Tool name		Description
Flare nut crowfoot Torque wrench		Removing and installing brake piping a: 10 mm (0.39 in)/12 mm (0.47 in)
	S-NT360	
Power tool		Removing nuts, bolts and screws
	PIIB1407E	

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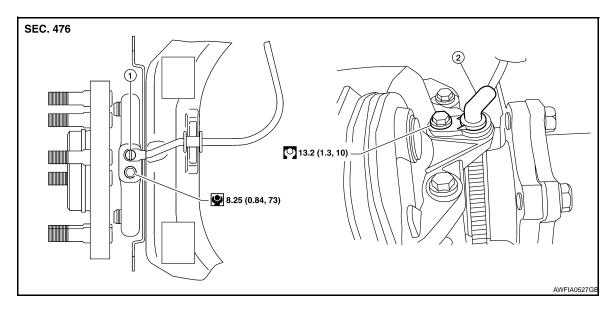
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REMOVAL AND INSTALLATION

WHEEL SENSORS

Removal and Installation

INFOID:0000000004427407



1. Front wheel sensor LH

2. Rear wheel sensor RH

REMOVAL

- 1. Remove the wheel and tire. Refer to WT-48, "Rotation".
- Remove the wheel sensor bolt.
 - When removing the front wheel sensor, first remove the disc rotor to gain access to the front wheel sensor bolt. Refer to <u>BR-44</u>, "Removal and Installation of Brake Caliper and Disc Rotor".
 - When removing the rear wheel sensor, first remove the spare tire.
- 3. Pull the wheel sensor out, being careful to turn it as little as possible.

CAUTION:

- Be careful not to damage wheel sensor edge or the sensor rotor teeth.
- · Do not pull on the wheel sensor harness.
- 4. Disconnect then wheel sensor harness connector, then remove the wheel sensor harness from the mounts and remove the wheel sensor.

INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Inspect wheel sensor O-ring, replace wheel sensor if damaged.
- Before installing the wheel sensor, make sure no foreign materials (such as iron fragments) are adhered to the pick-up part of the wheel sensor, to the inside of the wheel sensor hole or on the sensor rotor in the wheel hub assembly.
- Clean wheel sensor hole and mating surface with brake cleaner and a lint-free shop rag. Be careful that dirt and debris do not enter the axle or wheel hub assembly.

NOTE:

Apply a coat of suitable grease to the wheel sensor O-ring and mating hole.

[TYPE 2]

SENSOR ROTOR

Removal and Installation

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FRONT WHEEL SENSOR ROTOR

The front wheel sensor rotors are built into the front wheel hub and bearing assemblies and are not removable. If damaged, replace the front wheel hub and bearing assembly. Refer to <u>FAX-9</u>, "Removal and Installation".

REAR WHEEL SENSOR ROTOR

Removal

Remove the side flange from the final drive assembly. Refer to <u>DLN-407</u>, "<u>Removal and Installation</u>" (R200) or <u>DLN-444</u>, "<u>Removal and Installation</u>" (R230).
 CAUTION:

Discard side oil seal.

Using suitable tool with Tool (puller), remove the sensor rotor from the side flange.

Tool number : ST30031000 (—)

Installation

 Install the new sensor rotor on the side flange using Tools and a suitable press as shown. Make sure the sensor rotor is fully seated on the side flange.

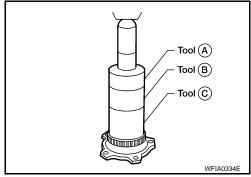
Tool numbers A: ST30720000 (J-25405)

B: ST27863000 (—)

C: KV40104710 (—)

CAUTION:

Do not reuse the old sensor rotor.



Install the side flange on the final drive assembly. Refer to <u>DLN-407</u>, "Removal and Installation" (R200) or <u>DLN-444</u>, "Removal and Installation" (R230).

CAUTION:

Do not reuse the side oil seal. The side oil seal must be replaced every time the side flange is removed from the final drive assembly.

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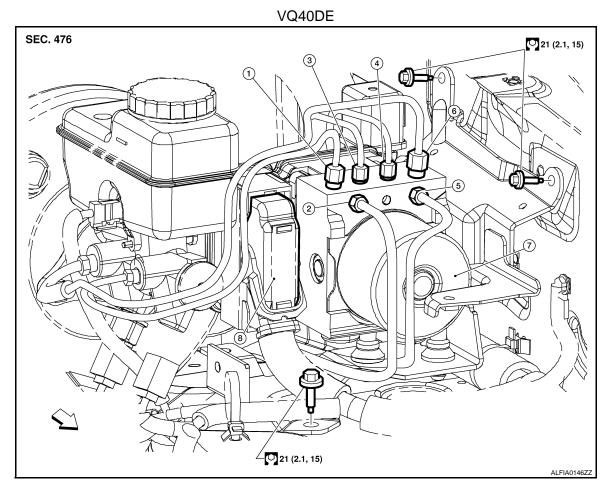
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ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

Removal and Installation

INFOID:0000000004427409



- From master cylinder secondary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- 4. To front right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 7. ABS actuator and electric unit (control unit)
- To rear right disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 5. To front left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- 8. Harness connector
- 3. To rear left disc brake 13.0 N·m (1.3 kg-m, 10 ft-lb)
- From master cylinder primary side 18.2 N·m (1.9 kg-m, 13 ft-lb)
- <□ Front

REMOVAL

- Disconnect the battery negative terminal.
- Drain the brake fluid. Refer to <u>BR-20, "Drain and Refill"</u>.
- Disconnect the actuator harness from the ABS actuator and electric unit (control unit). CAUTION:
 - To remove the brake tubes, use a flare nut wrench to prevent the flare nuts and brake tubes from being damaged.
 - Be careful not to splash brake fluid on painted areas.
- 4. Disconnect the brake tubes.
- Remove the three bolts and remove the ABS actuator and electric unit (control unit) and bracket.
- 6. Remove the bracket from the ABS actuator and electric unit (control unit).

INSTALLATION

Installation is in the reverse order of removal.

If the ABS actuator and electric unit (control unit) is replaced, the neutral position of the steering angle sensor position must be reset. Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

ACTUATOR AND ELECTRIC UNIT (ASSEMBLY)

< REMOVAL AND INSTALLATION >

[TYPE 2]

CAUTION:

- To tighten the brake tube flare nuts use a suitable tool (flare nut wrench).
- Always tighten the brake tube flare nuts to specification when installing.
- Never reuse the drained brake fluid.
- After installation of the ABS actuator and electric unit (control unit), refill the brake system with new brake fluid. Then bleed the air from the brake system. Refer to BR-20, "Bleeding Brake System".
- If the ABS actuator and electronic unit (control unit) is replaced, the neutral position of the steering angle sensor must be reset. Refer to BRC-141, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

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STEERING ANGLE SENSOR

Removal and Installation

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REMOVAL

- 1. Remove the spiral cable. Refer to SR-7, "Removal and Installation".
- 2. Remove the screws and remove the steering angle sensor from the spiral cable.

INSTALLATION

Installation is in the reverse order of removal.

 Reset the neutral position of the steering angle sensor. Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

CAUTION

Any time the steering angle sensor is removed and installed or replaced, you must reset the neutral position of the steering angle sensor. Refer to <u>BRC-141</u>, "ADJUSTMENT OF STEERING ANGLE SENSOR NEUTRAL POSITION: Special Repair Requirement".

[TYPE 2]

G SENSOR

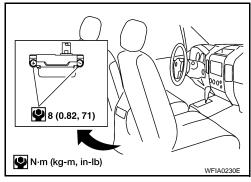
Removal and Installation

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REMOVAL

- 1. Remove the center console. Refer to IP-16, "Exploded View".
- 2. Remove the yaw rate/side/decel G sensor nuts as shown. CAUTION:
 - Do not use power tools to remove or install the yaw rate/ side/decel G sensor.
 - Do not drop or strike the yaw rate/side/decel G sensor.
 NOTE:

The location of the yaw rate/side/decel G sensor is the same for all models.



3. Disconnect the yaw rate/side/decel G sensor connector and remove the yaw rate/side/decel G sensor.

INSTALLATION

Installation is in the reverse order of removal.

• After installing the yaw rate/side/decel G sensor, it is necessary to calibrate the yaw rate/side/decel G sensor. Refer to BRC-142, "CALIBRATION OF DECEL G SENSOR: Special Repair Requirement".

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